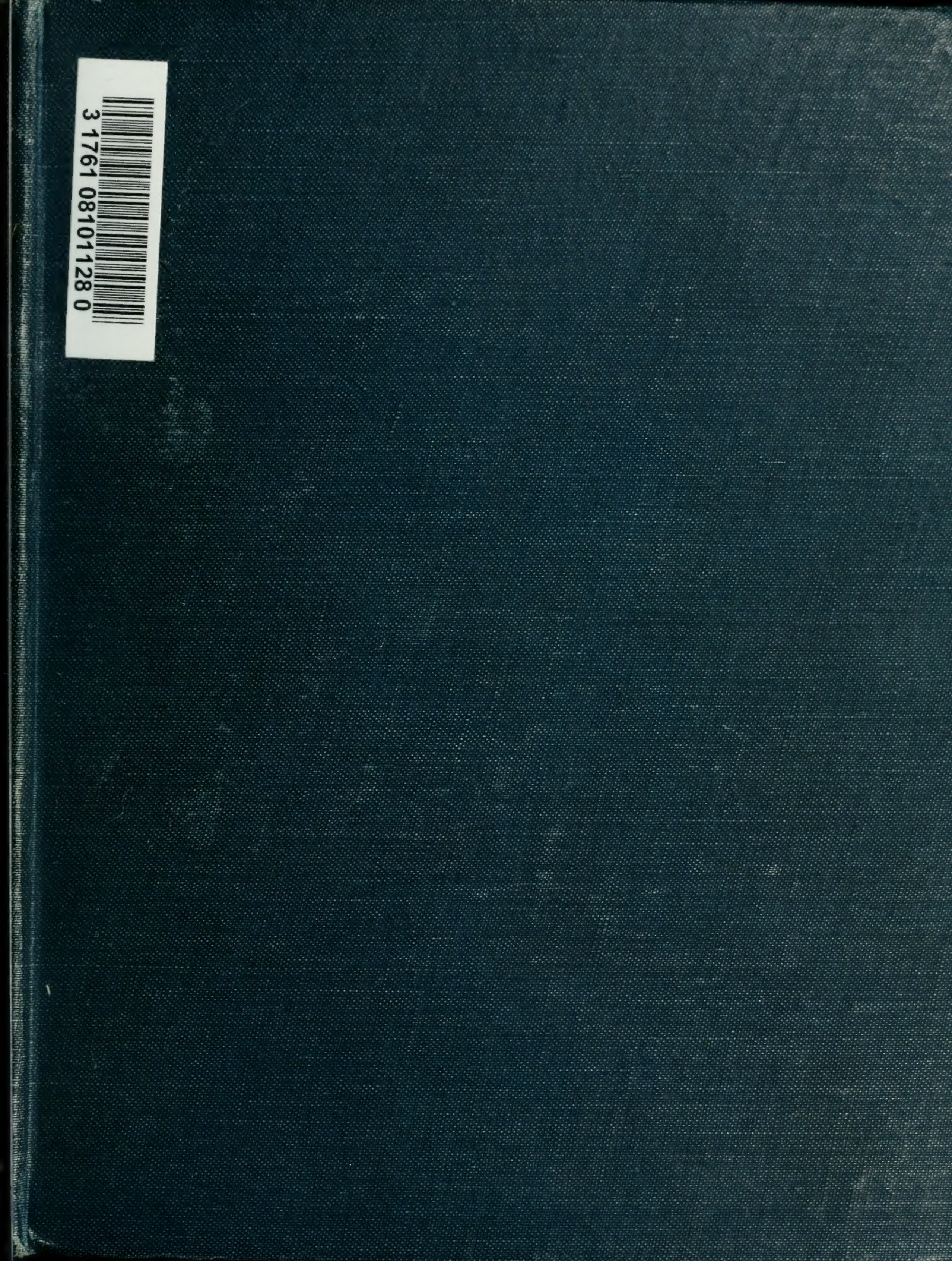

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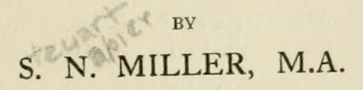
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MCMXXII

THE ROMAN FORT
AT
BALMUILDY
(SUMMERSTON, NEAR GLASGOW)

ON THE ANTONINE WALL



BY

S. N. MILLER, M.A.

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BEING AN ACCOUNT OF EXCAVATIONS CONDUCTED ON BEHALF OF

THE GLASGOW ARCHÆOLOGICAL SOCIETY

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PREFACE

The appeal for renewed exploration of the Roman frontier between Forth and Clyde with which Dr. George Macdonald in 1911 concluded his *Roman Wall in Scotland* did not remain long unanswered. In the following year the Glasgow Archaeological Society decided to resume the task which its *Antonine Wall Report* had begun. Balmuildy was selected as the station to investigate, since it seemed improbable that the opportunity would long remain to uncover a site lying within a couple of miles of the municipal boundary of Glasgow. The owner of the site, Captain (now General) Archibald Stirling of Keir, willingly gave permission to excavate, and generously directed that all finds should be handed over to the Hunterian Museum. The Council of the Society invited me to superintend the work and prepare the Report. Excavation was begun in August, 1912, and was continued, with breaks during the winter months, until it was put an end to by the outbreak of war. By then the possibilities of the site had been practically exhausted.

The heavy expense of this prolonged investigation was met mainly by subscriptions from the members of the Society, and by a grant from the Society's funds. A donation was received from the City of Glasgow, and a grant of £100 was made by the Carnegie Trustees. In addition to that substantial contribution the Carnegie Trustees granted £100 towards the production of the Report.

Before leaving on Active Service I had time to draft that part of the Report which deals with the Structural Remains, and to draw up an inventory of the finds. The systematic description of the finds and the completion and revision of the Report as a whole had to stand over until after my demobilization in 1919.

In the direction of the excavations I enjoyed the co-operation of an Excavation Committee of the Society, which included Dr. George Macdonald, Dr. George Neilson, Mr. John Annan, Mr. Ludovic M. Mann, Mr. Alexander Park, Mr. James White and Mr. C. E. Whitelaw.

In the field work I was greatly assisted by the experience and shrewd judgment of our Clerk of Works, Mr. Alexander Mackie, who continued at Balmuildy the long service he had rendered, at Newstead and elsewhere, to the archaeology of Roman Scotland. I also received valuable help from Mr. J. Alan Black, now of the Malayan Civil Service. I must add that our work was greatly facilitated by the good humour and courtesy of Mr. Jack, the tenant of Easter Balmuildy farm.

The task of planning our results was begun by Mr. Gordon Macfarlane, continued by the late Mr. Charles Cleland Harvey and by Mr. Leslie Rollo, and finally completed by Miss Margaret Cameron. With the exception of the map on p. 2, which I owe to Mr. James MacHale, all the drawings here reproduced are the work of Miss Cameron, and I have to thank her for much general assistance as well as for her careful draftsmanship. For the photographic illustrations the Society is indebted to the liberality of Mr. John Annan, who has grudged no expense or pains to make the pictorial record of the excavations as complete and exact as possible. In this he was ably assisted by Mr. John Campbell.

Dr. George Macdonald, besides supplying a detailed description of the Coins, has always been ready to give me the benefit of his invaluable advice, and he was good enough to read over this Report in its first draft as well as in proof. His *Roman Wall in Scotland* provides, of course, the framework to which the details of particular sites like Balmuildy are to be related. And it may be as well to state here that, in deciding what explanatory matter could be omitted, I have taken for granted that all who were likely to read this Report would be familiar with Dr. Macdonald's book.

I have to thank Professor T. H. Bryce for his note on the Animal Remains and Professor J. W. Gregory for a report on some samples of soil submitted to him. Others to whom I am indebted for help are the late Professor F. Haverfield, Mr. James Curle, Mr. T. Davies Pryce, Mr. F. G. Simpson,

Dr. George Neilson, Mr. J. Jeffrey Waddell, Professor J. S. Phillimore, the Rev. Dr. George Calder, Miss Aline M. Woodrow and Mr. William Kinghorn.

I must also thank Dr. James MacLehose and Mr. S. Douglas Jackson for the personal trouble they have taken with the production of the Report.

S. N. M.

GLASGOW, *December*, 1921.

CONTENTS

APPENDICES

LIST OF PLATES

LIST OF FIGURES IN THE TEXT

ABBREVIATED REFERENCES

In citing modern works, periodicals, etc., the following abbreviated titles are used :

Ambleside I ='Report on the exploration of the Roman Fort at Ambleside, 1913,' by R. G. Collingwood and L. B. Freeston, *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*, vol. xiv. New Series, pp. 433-465.

Ambleside II ='The Exploration of the Roman Fort at Ambleside: Report on second year's work, 1914,' by R. G. Collingwood, same *Transactions*, vol. xv. New Series, pp. 1-62.

Arch. Ael. =*Archaeologia Aeliana* (Society of Antiquaries of Newcastle-upon-Tyne).

Ardoch ='Account of the Excavation of the Roman Station at Ardoch, Perthshire,' *Proceedings of the Society of Antiquaries of Scotland*, vol. xxxii. (1897-8), pp. 399-435.

A. W. R. =*The Antonine Wall Report* (Glasgow Archaeological Society, 1899).

Bar Hill =*The Roman Forts on the Bar Hill*, by George Macdonald and Alexander Park (1906).

Berichte R.-G. K. =*Berichte der römisch-germanischen Kommission.*

Birrens ='Account of the Excavation of Birrens, a Roman Station in Annandale,' *Proceedings of the Society of Antiquaries of Scotland*, vol. xxx. (1895-6), pp. 81-199.

Bonn. Jahrb. =*Bonner Jahrbücher* (Jahrbücher des Vereins von Altertumsfreunden im Rheinlande).

Camelon ='Account of the Excavation of the Roman Station at Camelon, near Falkirk,' *Proceedings of the Society of Antiquaries of Scotland*, vol. xxxv. (1900-1), pp. 329-417.

Carlisle ='Catalogue of the Roman Pottery in the Museum, Tullie House, Carlisle,' by Thomas May, *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*, vol. xvii. New Series, pp. 114-197.

Castlecary	=' Excavation of Castlecary Fort on the Antonine Vallum,' *Proceedings of the Society of Antiquaries of Scotland*, vol. xxxvii. (1902-3), pp. 271-346.
Castleshaw I	=*The Roman Forts at Castleshaw—First Interim Report* (1908).
Castleshaw II	=*The Roman Forts at Castleshaw—Second Interim Report* (1911).
C.I.L.	=*Corpus Inscriptionum Latinarum.*
Cohen [2]	=Cohen, *Médailles impériales*, 2nd ed. (1880-1892).
Corbridge	=' Report of the 1911 Excavations at Corstopitum—The Pottery,' by J. P. Bushe-Fox, *Archaeologia Aeliana*, 3rd series, vol. viii. pp. 168-185.
Cumb. Trans.	=*Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society.*
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Déch.	see Déchelette.
Déchelette	=J. Déchelette, *Les vases céramiques ornés de la Gaule romaine* (1904).
v. Domaszewski, Hyginus	=Hygini Gromatici *liber de munitionibus castrorum*, ed. A. v. Domaszewski (1887).
v. Domaszewski, *Rangordnung*	=*Die Rangordnung des römischen Heeres*, by A. v. Domaszewski (1908).
Dr.	see Dragendorff.
Dragendorff	=H. Dragendorff, 'Terra Sigillata,' *Bonner Jahrbücher*, Heft xcvi.-xcvii. (1895-6).
Elslack	=' The Roman Forts at Elslack,' by Thos. May, *Yorkshire Archaeological Journal*, vol. xxi. pp. 113-167.
Eph. Epig.	=*Ephemeris Epigraphica.*
Fölzer	=E. Fölzer, *Die Bilderschüsseln der ostgallischen Sigillata-Manufakturen* (1913).
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Hofheim	=' Das frührömische Lager bei Hofheim i. T.', by E. Ritterling, *Annalen des Vereins für Nassauische Altertumskunde und Geschichtsforschung*, Band xl. (1912).
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Lud. see Ludowici.

Ludowici I =W. Ludowici, *Stempel-Namen römischer Töpfer von meinem Ausgrabungen in Rheinzabern*, 1901-1904.

Ludowici II =id., *Stempel-Bilder römischer Töpfer aus meinem Ausgrabungen in Rheinzabern*, 1901-1905.

Ludowici III =id., *Urnen-Gräber römischer Töpfer in Rheinzabern*, 1905-8.

Ludiwici IV =id., *Römische Ziegel-Gräber*, 1908-1912.

Macdonald =George Macdonald, *The Roman Wall in Scotland* (1911).

Niederbieber ='Das Kastell Niederbieber,' by E. Ritterling, *Bonner Jahrbücher*, Heft cxx. (1911), pp. 259-278.

Oelmann =F. Oelmann, *Die Keramik des Kastells Niederbieber* (1914).

O. R. L. =*Der obergermanisch-raetische Limes.*

Poltross Burn ='The Milecastle on the Wall of Hadrian at the Poltross Burn,' by J. P. Gibson and F. G. Simpson, *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*, vol. xi. New Series, pp. 390-461.

Proc. Soc. Ant. =*Proceedings of the Society of Antiquaries of London.*

Proc. Soc. Ant. Scot. =*Proceedings of the Society of Antiquaries of Scotland.*

R. L. Ö. =*Der römische Limes in Österreich.*

Silchester =*The Pottery found at Silchester*, by Thos. May (1916).

Simpson =F. G. Simpson, 'Excavations on the line of the Roman Wall in Cumberland during the years 1909-12,' *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*, vol. xiii. New Series, pp. 297-397.

Slack ='Excavations at Slack, 1913-1915,' by P. W. Dodd and A. M. Woodward, *Yorkshire Archaeological Journal*, vol. xxvi. pp. 1-92.

Wrox. I, II, III =*Excavations on the Site of the Roman Town at Wroxeter, Shropshire*, 1912, 1913, 1914 (Reports of the Research Committee of the Society of Antiquaries of London).

Westd. Zeitschr. =*Westdeutsche Zeitschrift.*

York =*The Roman Pottery in York Museum*, by Thos. May (1912).

THE SITE.

Balmuildy[1] has long been known as the site of one of the stations on the Antonine Wall. The list of forts drawn up by Timothy Pont towards the end of the sixteenth century and published in Blaeu's Atlas (Amsterdam, 1654) includes one "at Bal-muydie."[2] From the accounts of Gordon, Horsley, Maitland and Roy, it is clear that in the eighteenth century considerable traces still showed above ground.[3] Roy, however, in 1755 already found them "very much defaced," and by Stuart's time they "are all to be numbered among the things that were."[4] The fort, in fact, had served as a quarry until none of its walls was left standing, though just beneath the surface foundations remained considerable enough to discourage ploughing.[5] The results obtained by excavating these remaining traces form the subject of this report.

The fort is situated rather less than two miles north of the municipal boundary of Glasgow, on the south bank of the river Kelvin, alongside the farmhouse of Easter Balmuildy. It is the fifth station from the western end of the Wall (see Fig. 1). A range of elevated ground along which the Antonine Vallum is carried from the east sinks down at this

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[1] On the name see Appendix C.

[2] *A.W.R.* pp. 35-6.

[3] Gordon, *Itinerarium Septentrionale* (1726), p. 53; Horsley, *Britannia Romana* (1732) p. 167; Maitland, *History and Antiquities of Scotland* (1757), p. 179; Roy, *Military Antiquities of the Romans in Britain* (published posthumously in 1793), p. 159.

[4] *Caledonia Romana*, 2nd ed. (1852), p. 317. The first edition appeared in 1845.

[5] Macdonald, p. 167.

point to the river valley and a marshy hollow around Millochan farm. The Vallum, accordingly, turns sharp north across the river (at a point no doubt fixed by an existing ford [1]) to mount another range of elevated

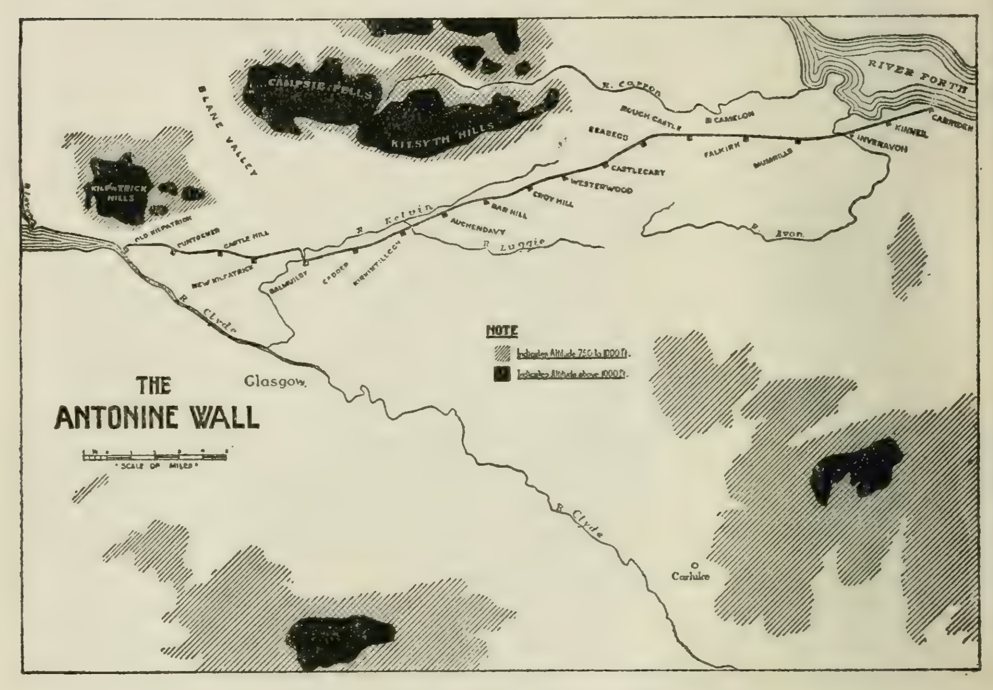


FIG. 1.—MAP OF THE ANTONINE WALL.

ground that rises up from the river valley upon the northern bank and runs continuously westward (Pl. I, *A*). At the angle so formed the fort of Balmuildy stood, guarding the crossing of the stream.

The fort would help to control what must have been an important area of communication (see Fig. 1). It is in this neighbourhood that native

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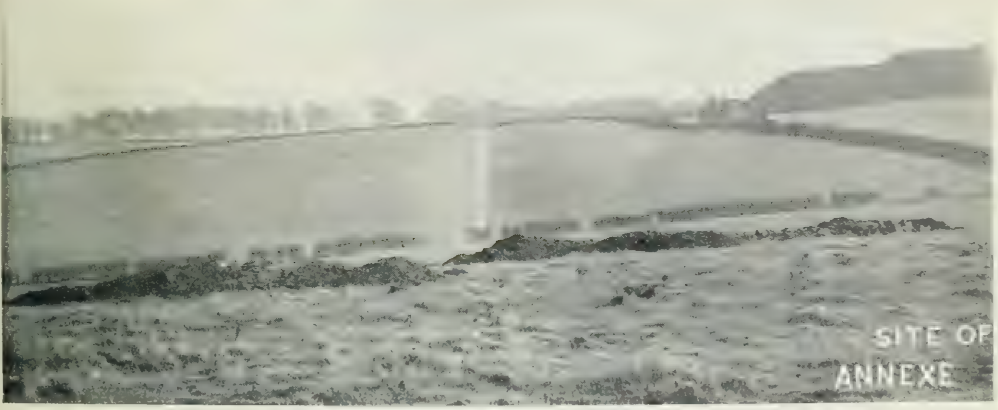
[1] It appears from Maitland (*loc. cit.*) that in his day the ford crossed the river a little to the west of the line of Rampart and Ditch ; that is, about the point where the Military Way must have crossed it.



A. VIEW FROM THE SITE OF THE FORT NORTHWARDS ACROSS THE KELVIN.
The dip on the skyline above the farmhouse indicates the course of the Antonine Ditch.



B. SITE OF THE FORT. LOOKING SOUTH-EAST.



C. VIEW FROM THE SITE OF THE FORT EASTWARDS.

movement through the Blane Valley gap (between the Campsie and Kilpatrick Hills) from the mountainous region of the north-west would come down upon the Clyde lowlands, and the passage of the Kelvin would give access to a route running southwards along the right bank of the Clyde. Indeed Balmuildy may have been the terminal point of a route by which the Roman troops maintained communication from the south with the western end of the Limes. There is some reason to believe that a road that passed up Annandale and down Clydesdale divided in the neighbourhood of Carluke,[1] one branch making a junction with the Limes at Castlecary, the other continuing north-westwards along the right bank of the river. For convenience and economy of distance this latter branch would hardly join the Limes further east than Balmuildy. On the other hand, it is not likely to have joined it further west. There was the ford across the Kelvin to draw it to this point; that it crossed the stream nearer its junction with the Clyde is in itself improbable, and it would mean that two roads—this and the Military Way—would be running almost alongside of one another. It is possible, then, that Balmuildy and Castlecary were twin terminals of the western road, a conjecture that perhaps finds some support in the close correspondence of the two stations, which are of about the same size and are distinguished from the other known forts on the Limes by being enveloped with a wall of stone.

From the river bed the ground rises abruptly for some feet, and then slopes gently upwards towards the south. It is on this gradual slope that the Fort is situated (Pl. I, *B*; Pl. LVIII, North to South Section). To the west the ground sinks to a marshy hollow, and on the east to a depression which has once been the bed of a stream (Pl. LVIII, West to East Section). The slope between this depression and the eastern defences of the Fort was found to have been occupied by an Annexe, protected on the north by the Antonine Vallum. Beyond the Annexe the ground rises again to form the elevated range along which the Vallum runs (Pl. I, *C*).

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[1] Macdonald, p. 216.

THE STRUCTURAL REMAINS

The Dimensions of Fort and Annexe. Fort and Annexe together covered an area of quite $9\frac{1}{3}$ acres, $7\frac{3}{5}$ acres being occupied by the Fort and its defences. The Fort itself was a rectangle with its major axis perpendicular to the line of the Vallum. Like most forts of its size, it approximated fairly closely to a square ; from north to south it measured 460 ft. over the ramparts, from east to west 413 ft. This gives an area of a trifle over $4\frac{1}{3}$ acres. Thus the Fort, though smaller than Mumrills, was rather larger than Castlecary, considerably larger than Cadder and the Antonine fort on the Bar Hill, and three or four times the size of Rough Castle.[1]

The Ditches of the Fort. The Fort was encircled by a system of ditches and by a stone wall, separated from one another by a berm so wide that the scarp and bottom even of the nearest ditch must have been well below the line of vision of anyone standing on the rampart-walk ; on the south and east the berm measured 30 ft., on the north and west 20 ft.[2] The ditches were found to average 12-13 ft. in breadth and 6-7 ft. in depth (from the present surface). They all appeared to be V-shaped, except the outer ditch on the east, which showed a peculiar profile along its northern half (see below). At the north-east corner the Antonine Ditch contracted to the same dimensions as the ditches of the Fort ; it then passed along the front of the Fort as the north ditch, expanding again as it turned off at the north-west corner. Along this front, which was protected by the river and the slope, there was a single ditch. On the west and south, where there was no natural protection, there was a triple row of ditches. At the south-east corner, however, the middle ditch stopped, while the outer ditch swung in to join the inner, the two thus composing a single ditch along the eastern side. On this side a detached outer ditch had

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[1] For Cadder and Mumrills see Macdonald, ' Recent Discoveries on the Line of the Antonine Wall,' *Proc. Soc. Ant. Scot.* xlix. pp. 115, 118.

[2] At Niederbieber the berm averaged about 20 ft. (*Niederbieber*, p. 262).



A. Northern Half of Outer East Ditch, looking North from East Gateway.



B. Northern Half of Outer East Ditch, Looking South.

been added, which presented, along its northern half, the peculiar character referred to. While it started by being V-shaped immediately north of the East Gateway, it gradually developed into a double ditch divided by a midrib.

Ditches with a central comb or midrib have been found in forts of widely different dates—in the early earthwork at Hofheim, for example, which dates to the reign of Claudius, and in the fort at Holzhausen, which may not have been erected till the early part of the third century ;[1] while ditches with zigzag profiles that approximate in varying degrees to the W-shaped ditch are not uncommon. Probably the explanation is not everywhere the same. The traces of wood that are commonly found in such ditches can be variously accounted for. At Hofheim Ritterling supposes the ditches to have been given a W-shaped profile to provide for *chevaux de frise* of thorns. At Balmuildy, however, there was no apparent reason why the length of ditch adjoining the Annexe should have been selected for such special defensive treatment. Nor would Ritterling's supposition explain the variations in the profile of our ditch.[2] When it ceased to be V-shaped, it presented at first the appearance of a ditch with a ledge cut into its counterscarp. It was only gradually, as the ledge deepened, that the ditch took the shape of a double ditch divided by a midrib ; and no sooner had it assumed this shape than the midrib turned inwards so as to close up the inner half of the ditch and allow the outer half to swing inwards and occupy the full breadth of the ditch for a length of thirty feet before it stopped behind the Antonine Rampart, which here abutted against the East Wall of the Fort. This graduated ledge cut into our ditch is somewhat analogous to the graduated trench cut along the berm at Ardoch.[3] A closer parallel is given by Gellygaer.

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[1] *Hofheim*, Pls. IV and V, and pp. 10-13 ; *O.R.L.* ' Holzhausen,' Pl. VI, 3.

[2] See Pl. II, *A-B*, and the section of the east ditches on Pl. LVIII.

[3] *Ardoch*, p. 421 (*c*). Cf. *Camelon*, p. 344 ; also Pl. III, Nos. 3 and 5, and pp. 355-6. It is suggested that the Ardoch trench was intended to drain the rampart, " but it seems to have been purposely covered over by laminae of earth, peat and gravel " (*Ardoch*, p. 422). A latrine trench ?

At the south-east gateway of that station the side gutters of the *via principalis* discharged into the inner V of a W-shaped ditch; this inner V began at street-level on either side of the gateway, and was carried down gradually to the full depth of the ditch.[1] The very similar arrangement at Balmuildy suggested that along the northern half of the east side, where the fall of the ground (as on the south-east side at Gellygaer) is very gentle, special provision had been made for a strong flush of water by cutting into the counterscarp of the ditch a graduated tread for a channel or trough (a latrine ?). With two bathhouses at hand, a supply of water would be available, and it was noted that, opposite the point where this ditch ended, a surviving fragment of the outer kerb of the Antonine Rampart was so solidly constructed as to suggest that it had flanked a culvert.

The Junction of the Fort Wall with the Antonine Rampart. The course of the stone wall which surrounded the Fort was traced by following the bottoming of cobbles on which it had rested, or, where even that was absent, the trench in which the cobbles had been laid. At the north-east corner the Antonine Rampart abutted against the East Wall of the Fort in such a way as to allow the North Wall to be continued as a revetment along its outer face for thirty feet, so securing the junction of turf and stone.[2] At the north-west corner this arrangement had to be modified owing to the angle at which the Antonine Vallum met the Fort. Here the North Wall of the Fort provided a finish to the turf structure by being continued through its thickness.[3] A revetment at this corner to the outer

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[1] See Ward, *The Roman Fort of Gellygaer : The Annexe* (1912), p. 14 and Fig. 5, sections *C*, *B*, *A* ; also the general plan, which, however, contradicts p. 14 in showing a side gutter of the *via principalis* discharging into the *outer* V of the ditch.

[2] See Pl. III, *A*. The bottoming of the Fort wall, which is laid 1½ ft. into the subsoil, is lower than the foundation of the Antonine Rampart.

[3] See Pl. III, *B*. Traces of the cobble bottoming of the North Wall extended, as the Plan (Pl. LVIII) indicates, a little beyond the inner kerb of the Antonine Rampart, as if the turf superstructure at its base had been rather broader than the stone foundation. This does not appear to have been the case (*A.W.R.* pp. 127-8). Alternatively, this projecting cobbling might be taken to mean tha



A. Junction of Antonine Rampart with Fort Wall at North-east Corner. Looking South-east.



B. Junction of Antonine Rampart with Fort Wall at North west Corner. Looking North-west.

(here the east) face of the turf Rampart would have required a continuation of the West Wall of the Fort. The way in which the turf Rampart, instead of abutting against the North Wall proper, abutted against a prolongation of it, would in fact have allowed the West Wall to be continued along its outer face, but though tumbled masonry was found here alongside the outer face of the turf Rampart, there was no trace of a continuation of the cobble bottoming of the West Wall.

The Structure of the Fort Wall. Of the masonry almost nothing was left except along some fifteen feet of the East Wall near the Annexe Bath-house (XVI), where two courses of the inner face and some traces of the outer remained to give an idea of the original structure (Pl. IV, *A*). Here a trench 9 ft. broad had been dug 1½ ft. into the subsoil, and in that bed large cobbles had been laid without any clay. Upon this bottoming rested the foundation course. It showed that the wall had consisted of an outer and an inner face of square-faced stones, keying into an interior core of rubble. Since the facing stones were commonly tapered inwards, they would have allowed of the penetration of run lime, and it is therefore possible that the rubble had been grouted with lime, as at Castlecary. If so, all trace of it had disappeared, nor was there any sign of clay. On the inner face, the foundation course was set off 1½ ft. from the edge of the cobble bottoming, so that the wall at its foundation was 7½ ft. thick (see p. 12, Fig. 2). The surviving fragment on which this description is based showed very little of the outer face. Stones found in the North Ditch proved that (on that side, at all events) a roughly chamfered course had further reduced the thickness of the wall, as at Castlecary, by some 6 in. (Pl. IV, *B*). These stones from the North Ditch, as well as isolated foundation blocks found *in situ* along the line of the North Wall, showed that there the outer face at its foundation had been much more massive than what remained of the inner face on the east side. Possibly the North Wall cannot be

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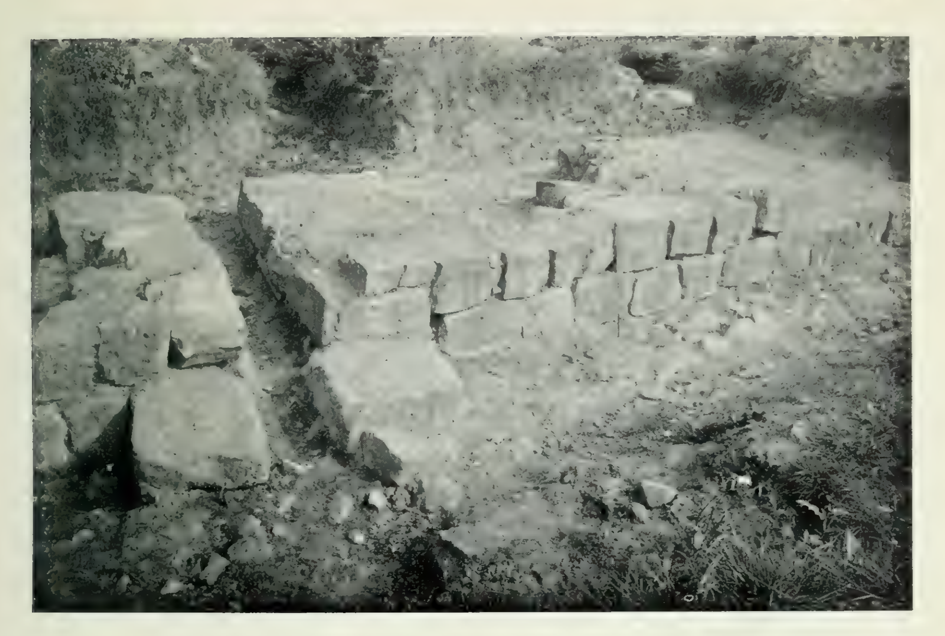
the North Wall had been returned along the *inner* face of the turf Rampart. Of such a return there was no trace. The probability is that the projecting cobbles, which did not show a finished edge, had been carried a little down the slope by the plough or other agency, and that the prolongation of the North Wall had ended flush with the inner kerb of the turf Rampart.

taken as representative. Its cobble bottoming was found to measure 11 ft. across, a breadth equalled elsewhere only at the south-east corner and (presumably) at the south-west corner (see below).

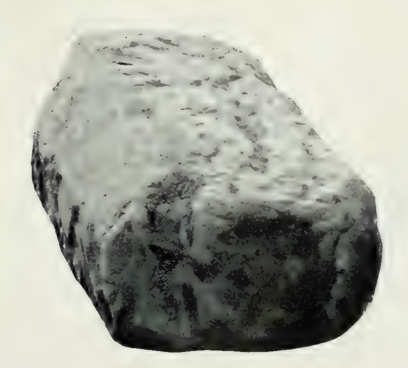
The details of the superstructure can only be conjectured. In the section (restored) given on p. 12 (Fig. 2), a total height of 15½ ft. is allowed to the Fort wall. The rampart-walk is assumed to have been 10½ ft. above ground-level and to have been surmounted by a parapet 2½ ft. high at the embrasures and 5 ft. high in all. Various evidences from other sites indicate these as normal dimensions. No normal width (it would appear) can be assumed for the embrasures. If we allow a thickness of 2 ft. for the parapet at its base (again a normal allowance), and suppose the wall to have been continued to the height of the rampart-walk at a thickness of 7 ft. (a maximum), we are left with 5 ft. for the rampart-walk. That is a sufficient, but not a liberal, allowance. The question arises whether more room for manning the wall had been supplied by an earth backing being set against its inner face.

The Space inside the Wall. On every side of the Fort, the inner face of the wall was separated from the adjoining street by a space which averaged nearly 20 ft. in breadth. The same feature occurred at Castlecary,[1] and there, as at Balmuildy, the question arose whether this space had been occupied by an earth backing. At Castlecary no trace of such a backing was noted. At Balmuildy remains that might have belonged to a backing were found in two places. Immediately to the south of a paved court at the south end of the Fort Bathhouse (XV), there was a mass of wrought clay (see p. 43, Fig. 9; cf. Pl. XVI, *A*). The southerly slope here is so very gentle that there was no need to supplement the ordinary system of drainage by any special provision for keeping the court dry. The clay may have represented the termination of a backing to the wall, interrupted at this point to allow room for the Bathhouse. Again, an artificial structure could

[1] This space is a normal feature of stone forts, as the evidence of the German Limes shows, and 20 ft. is a normal breadth there for the Antonine period. In many of the German forts remains of a backing have been noted. Where no actual remains have been detected, a backing is still, as a rule, assumed to have been present.



A. Inner Face of East Wall with Drain.



B. Stone from North Ditch at North-west Corner.

be traced from near the West Gateway to the north-west corner, where it thinned off along the edge of a zigzag drain, which passed out here through the North Wall. For at least half its length it was composed of clay, with some stones along its inner margin. Where it thinned off towards the north-west corner, it appeared as a compacted body of sandy earth with a spread of boulders underlying it ; this earth resembled the natural soil, and had no doubt been derived from the ditches. The structure had been made up throughout in layers separated by dark bands of carbonaceous matter. In its composition, therefore, it resembled the stratified ramparts which have been found at Ardoch, Camelon, Lyne and Birrens. It extended 1½ ft. over the edge of the cobble bottoming of the West Wall, and so had abutted against the inner face of the masonry. As found, its surface was level with the adjoining street. Between its inner margin and the street a mass of sooty matter, mixed with fragments of coarse pottery, ran almost its whole length.

The lie of the ground hereabout was sufficient of itself to explain the banking up of this space behind the West Wall. The westerly slope was such that the zigzag drain and the street it passed through had had to be laid on " forced " soil, and between them and the cobble bottoming of the wall the ground dropped sharply another two or three feet. It was in this dip that the stratified mass of clay and earth was found, its inner margin coinciding with the line of fall. Obviously, then, it might be explained simply as a filling ; one could not take for granted that here a protected hollow had preserved the actual base of a backing which elsewhere had all but disappeared. Yet this latter interpretation would be, on the whole, the more natural one. It would suit the composition of the structure much better than would the supposition that it was a mere filling.

If we did regard this structure as the remnant of the base of a backing to the wall, we should probably be right in taking the more sandy, rather than the more clayey, portion of it as representative. Along the clay section itself there was no spread of clay over the adjacent area to show that there had been a superstructure of that material, while the clay south of the paved court of the Fort Bathhouse, if part of a backing, would

simply prove that the backing had been finished off there with clay, not that it had been constructed of clay throughout. The employment of clay throughout, whether for body or base, seems improbable, since it must have left traces which could hardly have escaped observation at other points than those noted. What we should have to suppose would be a backing composed mainly of the upcast of the ditches,[1] like the northern part of the structure inside the West Wall. A backing composed of the sandy soil in which the ditches were cut, once it was levelled, would leave no recognisable trace of itself. Such a backing could, of course, equally be supposed if we regarded the structure behind the West Wall as a mere filling; it would simply mean that there the backing had rested upon made-up ground. In that case, it is true, we should have no actual remains of the backing itself to point to on the west side, but there were one or two features there, quite apart from the mass of clay and compacted earth, which distinctly suggested that there had been a backing. For one thing, the stones found in the rear of the stratified clay, though not composing a definite structure, were roughly in alignment, and might be interpreted as the remains of a retaining kerb that had been laid along the heel of an earth superstructure. Again, the mass of sooty matter that lay between the street and the stratified clay and earth formed a narrow band so well defined as almost to imply that, besides being limited inwards by the edge of the street, it had been limited outwards by a raised structure intervening between it and the wall.

One feature which had to be considered in this connection was a bed of masonry shivers that lay immediately inside the North Wall.[2] At Housesteads such chippings were apparently worked into the body of the backing, but at Balmuildy they formed a well-defined layer, level with the adjoining street. Since masonry shivers were largely employed to harden the floors of the roofed buildings of the interior, their presence

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[1] For a bank 20 ft. broad at its base and rising at a slope of 30°-40° to a flat surface 10½ ft. above ground-level (see Fig. 2) the material supplied by the Fort ditches (alone) would be sufficient.

[2] Such a bed was also exposed under the flagged courtyard at the south end of the Fort Bathhouse (see p. 43).

here gave rise to the conjecture that a roofed structure might have been erected against the North Wall. Certain of the stone forts on the German Limes, besides yielding remains which have been interpreted as proving that the space immediately behind the wall was open to occupation, presented certain structural features which seemed to imply that the space had been occupied by a wooden scaffolding, or platform, built against the inside of the wall. In every case, however, the evidence was ambiguous and admitted of an alternative explanation.[1] At Balmuildy there was no ground for supposing a wooden erection except the stratum of chippings, and this feature, when examined, itself disproved the conjecture to which it had given rise. Our exploratory trenches produced no objects from it, and wherever it was cut through, it showed as a quite clean bed of a rather loose composition ; it had nothing of the appearance of a compacted and trampled floor, roofed or unroofed. Its appearance suited much better with the supposition that it had been covered over as soon as deposited. As a bottom to a backing, such a bed of shivers would serve a structural purpose, for it would facilitate the escape of moisture working down from the earth superstructure.

It need hardly be said that it cannot be taken as evidence against the presence of a backing that an oven had been built immediately inside the South Wall, west of the South Gateway, or even that a considerable length of the space behind the wall north of the East Gateway was occupied by a bathhouse. At Housesteads and Great Chesters, as at Miltenberg and other forts on the German Limes, such erections simply indicated that the earth backing had not been continuous, or had been, in varying measure, removed.[2] Indeed, if the interval between the inside of our wall and the

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[1] See especially Ritterling, *O.R.L.* 'Wiesbaden,' pp. 18-19. Cf. Fabricius, *O.R.L.* 'Urspring,' pp. 5-6.

[2] *Housesteads*, Plan ; *Arch. Ael.* xxiv. Plan ; *O.R.L.* 'Miltenberg,' p. 13. At Miltenberg such intrusive buildings are assumed to have been covered with a flat timber roof which would make the rampart-walk continuous at its full breadth. Our bathhouse (XV) may have had such a roof. The absence of roofing tiles here, where other structural debris was abundant, may perhaps be taken as significant. See also p. 41, n. 2.

adjoining street had been an open space all round, the erection of a bath-house and an oven would hardly have exhausted the uses to which it would have been put; yet not one of a large number of exploratory trenches supplied any clear indication that elsewhere the space had been made use of or was open to access. They revealed no marks of occupation outside the edge of the street, except the band of sooty matter on the west side—an exception which (as we have seen) rather goes to prove the rule.

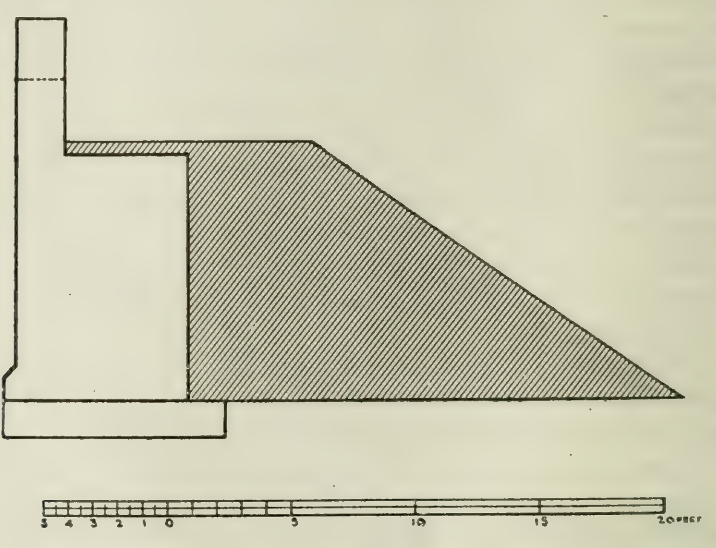


Fig. 2.—Restoration of Fort Wall with earth backing.

That wall and *vallum* were a natural combination to the builders of our fort is shown by their prolonging the North Wall at the north-east corner along the face of the turf Rampart. Nor is the supposition that our wall was combined with an earth rampart, or backing, round the circuit of the Fort precluded by the massiveness of the wall or by the fact that its inner face (as judged by the surviving fragment on the east side) was as carefully finished as some of the masonry of the interior buildings; for we have at Newstead a Scottish example of a wall as massive

as ours and as carefully finished on the inside, which yet was supplemented with a backing of clay.[1] In such cases the stone wall, too massive for a mere revetment, must be regarded as the main defence. Such a wall, it is true, hardly requires the support of an earth backing, but the backing would still be essential for the effective manning of the *enceinte*; and there are later forts than Newstead or Balmuildy (Niederbieber and Holzhausen, for example [2]) to prove that the stone fort long retained this mark of its derivation from the entrenchments of a field force. In the removal of the earth backing at Miltenberg and elsewhere we may, perhaps, recognise a stage in the transition to the independent stone wall. But such independent walls appear to be quite a late development. In Britain they are represented (apparently) in our bastioned coast-forts, but neither in Britain nor elsewhere would there appear to be any certain example of a second-century stone fort in which the wall has not been supplemented with an earth backing. That consideration, along with certain evidences we have drawn attention to, favours the assumption that at Balmuildy a backing such as is illustrated in Fig. 2 had occupied the 20 ft. space between the wall and the adjoining street.

The Corners. At the north-east corner an expansion 4-5 ft. thick had been added to the inner face of the North Wall for a length of nearly 50 ft. The remains of this expansion consisted in a foundation of clay and cobbles laid on, and not into, the subsoil, and therefore higher than, and independent of, the cobble bottoming of the wall proper (Pl. V, *A*). To judge by the remains of a similar expansion at the north-west corner, this foundation had carried masonry. Whether it had ever been returned a little along the East Wall, as the corresponding expansion at the north-west corner was returned along the West Wall, is uncertain. There was no trace left of such a return, but in this corner there had been much reconstruction. The expansion at the north-west corner, which was of about the same thickness, had been set inside the North Wall for a length of 40 ft. It had been returned a few feet along the West Wall, its breadth

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[1] Curle, Pl. VI, 1, and pp. 32-34.

[2] *Niederbieber*, p. 264; *O.R.L.* 'Holzhausen,' p. 6.

here being doubled. A fragment of masonry remained *in situ* at the angle of return (marked *MM* on Fig. 3; see also Pl. V, *B*).

Similar expansions have been found elsewhere in Britain, notably at Castlecary, High Rochester and Housesteads. At Housesteads strips of masonry were added here and there inside the original wall, increasing the thickness from 5 ft. to about 10 ft.[1] At Castlecary, as at Balmuildy, the increased thickness was at the north corners along some 45 ft. of the north wall, the increase there (3 ft.) being obtained not by an added expansion but by a thickening of the main wall itself.[2] At High Rochester the west wall was increased in thickness from 10½ ft. to 28 ft. along 80 ft. to the south of the gateway and for about 40 ft. to the north of it, while the south wall was increased in thickness to 20 ft. for a length of 50 ft. east of the gateway.[3] Such thickenings may well have been intended to provide a solid platform for the projectile-throwing engines. At Balmuildy a number of ballista balls were found inside the North Wall. At High Rochester, not only were heavy ballista balls found, but also two inscriptions (one of them alongside the West Wall) recording the erection and restoration of *ballistaria*.[4] At Balmuildy the total thickness along the expansions was 16 ft. This, though less than the space provided at High Rochester, would be enough for the mounting of artillery. At the north-west corner, however, it had been supplemented by an additional structure (Fig. 3; Pl. V, *B*).

Where the expansion stopped inside the West Wall at the north-west corner, there was a mass of earth and stones retained by rude walling; it was of the same breadth as the expansion here (10 ft.) and about 12 ft. in length. A similar mass of earth and stones, but with no trace surviving of any retaining face, was found alongside the expansion inside the North Wall at a distance of about 20 ft. from the corner; it measured some 20 ft. long by about 8 ft. broad. Similar patches of rough stonework

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[1] *Housesteads*, Plan and p. 247.

[2] *Castlecary*, pp. 279, 291.

[3] *Arch. Ael.* N.S. i. p. 70; Bruce, *Roman Wall*, 3rd ed. pp. 250-1.

[4] *C.I.L.* vii. 1045-6.

PLATE V.



A. North-east Corner of Fort. Looking West.



B. North-west Corner. Looking South-east.

were found at the corners of each of the forts at Castleshaw and on each side of the south gateway of the later fort at Elslack.[1] At Elslack, these structures, whether or not they were the solid bases of towers, must have carried a wooden gangway continuing the rampart-walk over the entrance. At Balmuildy (as no doubt at Castleshaw) their purpose must have been much the same; they must have served as bases or piers supporting a

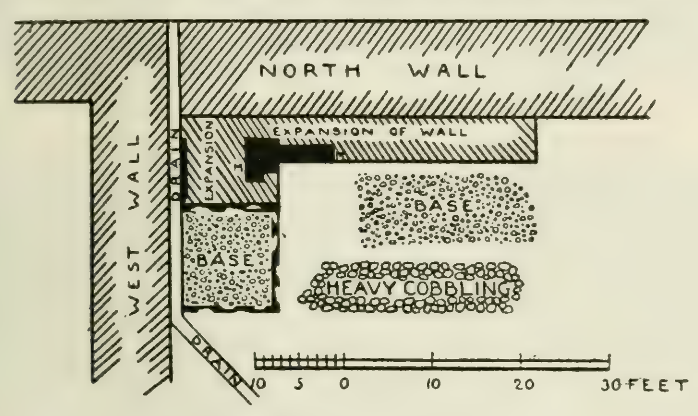


FIG. 3.—NORTH-WEST CORNER OF FORT.

wooden platform. An abundance of iron nails was found in this corner, and the space between the bases gave evidence of habitation which seemed to imply that it had been roofed over, as by a platform—dark occupation-earth well trampled, fragments of pottery and of bottle glass (but no window glass), a penannular fibula and an earthenware lamp. If the platform itself, or part of it, was surmounted by a turret, this can only have been of wood. But there may have been no such superstructure. The piers had, of course, been intended to carry a considerable weight, just as an adjacent stretch of very heavy cobbling had been laid down to stand exceptional wear and tear,[2] but it is quite probable that what they

[1] *Castleshaw I*, Plan and p. 22; *Elslack*, pp. 131-2.

[2] Compare the "stone paved surface" inside the north-east corner at Castlecary (*Castlecary*, p. 293).

supported was simply a platform for heavy engines, not a walled and roofed turret; in other words, that the same space (20-28 ft.) as was provided at High Rochester by extending the wall itself inwards to the full extent required had been provided at Balmuildy in a more makeshift manner by supplementing a thickened length of wall with a wooden platform supported on rude piers or bases. This rough structure, perhaps improvised at some time during the occupation, recalled the *tribunalia* recommended by Hyginus for field entrenchments as a substitute for corner turrets.[1]

The south-east corner, which was rounded in the usual manner, had been occupied by a turret of the normal ground-plan. Of the turret itself nothing remained except the cobble foundations, which gave a thickness of 2-2½ ft. for the side walls and 3 ft. for the back wall. The front wall was, of course, formed by the main wall of the Fort, the cobble bottoming of which expanded here from 9 ft. to 11 ft.[2] There was no debris to supply information as to the details of the superstructure. The foundations showed that the turret had projected 12 ft. from the inside of the Fort wall, narrowing inwards (as is usual) from 18 ft. (over the foundations) to 14 ft. No doubt the other free corner (south-west) had been similarly treated. It

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[1] *Meminisse oportet . . . tormentis tribunalia extruere . . . in coxis in loco turrium* (*De Munit. Castr.* 58). In the north-east corner the original arrangement was obscured by the insertion and subsequent destruction of a bathhouse. The space between the bathhouse and the expansion inside the North Wall had not been covered with a backing to the Wall; it had been open to access and showed marks of occupation (see p. 45). If the bathhouse was roofed with timber, as has been suggested above (p. 11, n. 2), this timber structure would presumably be carried as a gangway over the space between the bathhouse and the North Wall. Something of the sort would be required to make the rampart-walk continuous. Whether such a structure would also serve as an artillery platform is doubtful. At all events, the back wall of the bathhouse would not have supported so great a weight as the solid bases erected in the north-west corner.

[2] The Plan (Pl. LVIII) shows this as a gradual expansion, as at Housesteads (*Housesteads*, Plan and p. 247) and Ambleside (*Ambleside I*, Fig. 6 and p. 442). Perhaps it should be shown rather as a 2 ft. projection along the face of the turret, as is usual in the forts of the German Limes. The remains were too indefinite for a decision.



A. North Gateway. Looking South.

B. Foundation Blocks with dovetailed Grooves for Cramps. East Guard-chamber at North Gateway.

lay across the public road in land belonging to another farm and was not excavated.

The Gateways. There were the usual four gateways. Of those on the west, south and east no more survived than just enough to show that they had been of the same pattern and about the same size as that on the north. Here the remains were more considerable (Pl. VI, *A*). Through the opening, which was 12 ft. wide, passed a roadway, still well preserved, with a short length of drain remaining at its western edge. It was flanked on either side by a guard-chamber measuring 14 ft. by 12 ft. over the foundations. These were deeply bedded in the natural soil, which, in the interior of the chambers, remained undisturbed at its original level. In the foundation blocks dovetailed grooves were cut (Pl. VI, *B*) ; the soil which had accumulated in them showed no trace of metal,[1] and cement may have been used, or possibly an oaken dowel, to cramp the stones together. In front, the cobble bottoming of the Fort wall, on either side of the opening, showed a 3 ft. projection 14 ft. wide—the width of the guard-chambers. Tumbled stones added considerably to the information given by the remains still *in situ*. Four fragments were found of an inscribed and sculptured slab recording the erection of the Gateway by men of the Second Legion in the governorship of Lollius Urbicus (see pp. 57-9, Nos. 1-4). Portions of chamfered plinth and one or two base mouldings (Pl. VII, *A*) showed that the Gateway had been given some architectural distinction, while other pieces of masonry supplied useful details for the reconstruction of the ground-plan (Fig. 4).

Two socketed stones were found in which gate-pivots had turned. One was quite fragmentary. For the other see Pl. VII, *B*, 4. It measures 1 ft. 4 in. wide by 1 ft. deep. The hole, which is cut in a corner of the stone, is 3 in. deep and 4 in. in diameter at the bottom. The bottom is grooved round the circumference so as to leave a raised button in the centre, as if the gate-pivot had been fitted with an iron shoe. Since there were two pivot-stones, the gate or door had been two-leaved, as one would expect from the width of the opening. There was no trace of a sill or

[1] Report from Professor J. W. Gregory. At Corbridge similar dovetailed sinkings showed slight traces of cement (*Arch. Ael.* 3rd ser. v. p. 324).

central door-stop, but that is not an invariable feature of double doors; at Housesteads Milecastle, for example, the leaves of the gate had closed on a bar working in holes in the passage walls, and we may suppose something of the sort for our Gateway. In any case, the arch would act as a stop, since the gate would presumably reach the crown of the arch. That

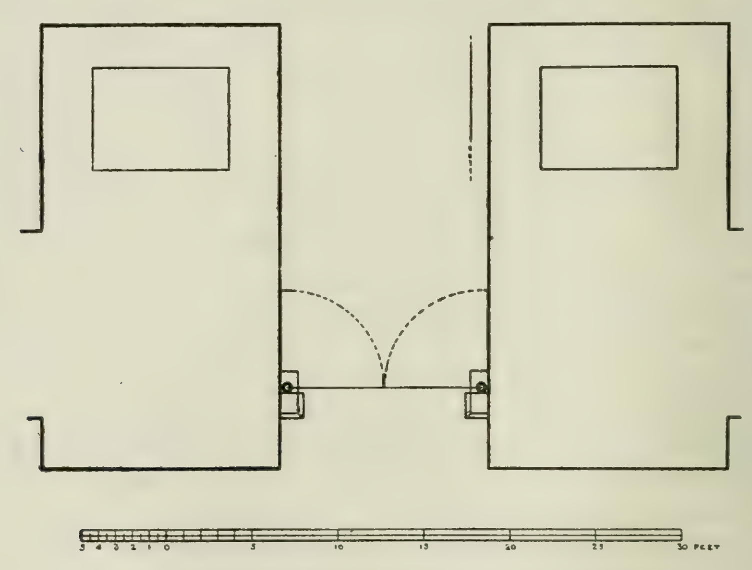
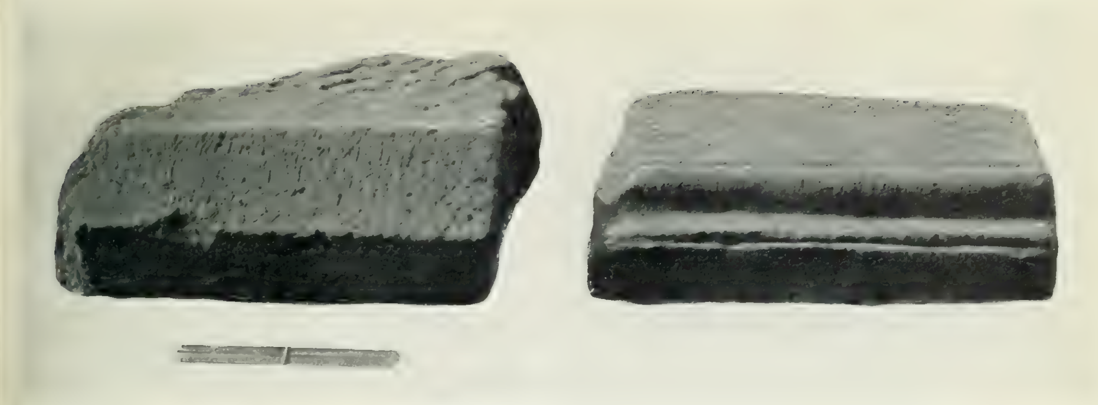


FIG. 4.—GROUND-PLAN (RESTORED) OF NORTH GATEWAY.

the entrance had been arched over was proved by a voussoir and a pair of moulded imposts. The imposts were both fragmentary; the more complete (Pl. VII, *B*, 3) showed that they had been 9½ in. high, and had measured 1 ft. 6 in. wide by 1 ft. 4 in. deep across the cap. The voussoir—apparently the keystone—was also in a damaged condition (Pl. VII, *B*, 2). Below a hammer-dressed 5 in. margin came a plain-tooled face, 12½ in. long but incomplete. In the 12½ inches the stone tapered from 9½ in. to 8 in. This gives a span of 10 ft. As the actual opening was 12 ft., we must suppose the piers of the arch to have projected 1 ft. on either side—just the projection, it will be noticed, which would suit piers serving as



A. Masonry from North Gateway.

1 2 3

4

B. Moulded Imposts, Voussoir and Pivot-stone from North Gateway.

jambs behind which pivot-stones 1 ft. deep were set. The passage walls had probably risen high enough to allow of the rampart-walk being continued over the gateway on a timber gangway.[1] The evidence of other sites shows that that (instead of a barrel vaulting) was a common arrange-

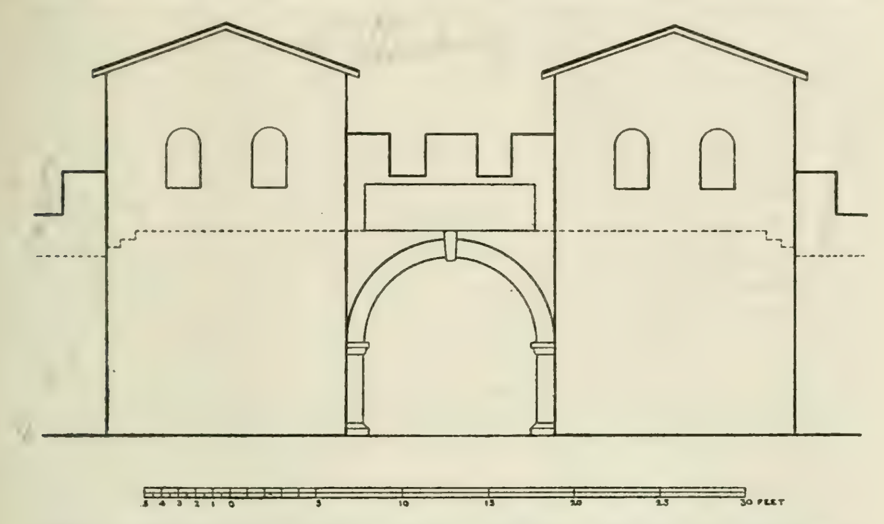


FIG. 5.—RESTORATION OF NORTH GATEWAY SHOWING TURRETS WITH TILED ROOFS.

ment, even where there was an inner as well as an outer arch.[2] At Balmuildy there was no evidence for two arches. Two arches would mean that the rampart-walk, where it crossed the entrance, had been walled-in back and front and roofed over. If we take it that there was a single

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[1] Evidences from various sites indicate that the height of the top of our imposts above ground-level may have been no more than 5½ ft. It can hardly have been less. If we add 5 ft. for the radius of the arch and about 1 ft. for the gangway with (say) a 6 in. clearance, we get 12 ft. as the height of the passage over the Gateway. That the rampart-walk was 12 ft. above ground-level throughout its circuit is possible, but that height would be rather above the average. The height assumed above in Fig. 2, viz. 10½ ft., is more probable. That, of course, would mean that the rampart-walk had been stepped up 1½ ft. on either side of the gateway. There is evidence from other sites for such stepping-up of the rampart-walk at the gateways.

[2] *E.g.* at Caerwent (*Archaeologia*, lix. p. 91 ; cf. *Poltross Burn*, p. 407).

arch—and that was all there was evidence for—we must suppose it to have carried the stone parapet, into which the Lollius slab would probably be built (see p. 59).

While much of the ground-plan can be laid down with reasonable probability, a restored elevation, even so partial a one as is shown in Fig. 5, cannot but contain a large element of conjecture. The tumbled masonry found here, if not so abundant as to prove of itself a lofty stone superstructure, was unusually plentiful, and it is to the North Gateway that one would most naturally apply a remark of Stuart's that "facing the Kelvin was a mass of ruins, probably of a watch-tower, which cost much trouble to root out." [1] These indications, along with the ground-plan, which is a normal one, and the massive foundation blocks, deeply bedded and cramped together, permit of our accepting the usual restoration so far as to picture the entrance as flanked on either side by a stone tower extending over the guard-chamber and over the Fort wall with its 3 ft. projection. But neither here nor at any of the other gateways was there evidence for tiled roofs, such as are shown in the customary elevation, to which our Fig. 5 conforms. An alternative is therefore given in Fig. 6, which shows the upper storey of each tower covered with a timber roof, itself providing a defensive platform and fronted with a parapet. The result is a gateway similar to one figured on a mosaic in the museum at Avignon.[2]

The Streets. The plan of the interior was outlined by the usual rectangular pattern of streets. That inside the North Rampart had been the most solidly constructed, and was the best preserved. It consisted of heavy cobbling overspread with stones and gravel. Elsewhere, however, little or no trace was found of a cobble substratum, and it appeared that most of the streets had consisted simply of a compacted mass of stones and gravel. They were not well preserved. Their course was sufficiently indicated by traces of gravel and, here and there, by surviving lengths

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[1] *Caled. Rom.* 2nd ed. p. 320.

[2] Reproduced by Ward, *Romano-British Buildings and Earthworks*, p. 70, from Roach Smith's *Collectanea Antiqua*.

of drain; but their breadth was a little uncertain. It appeared to be considerable. The *via principalis* seemed to be over 30 ft. in breadth; the street behind the central buildings was not much less, and the others appeared to average about 25 ft.[1]

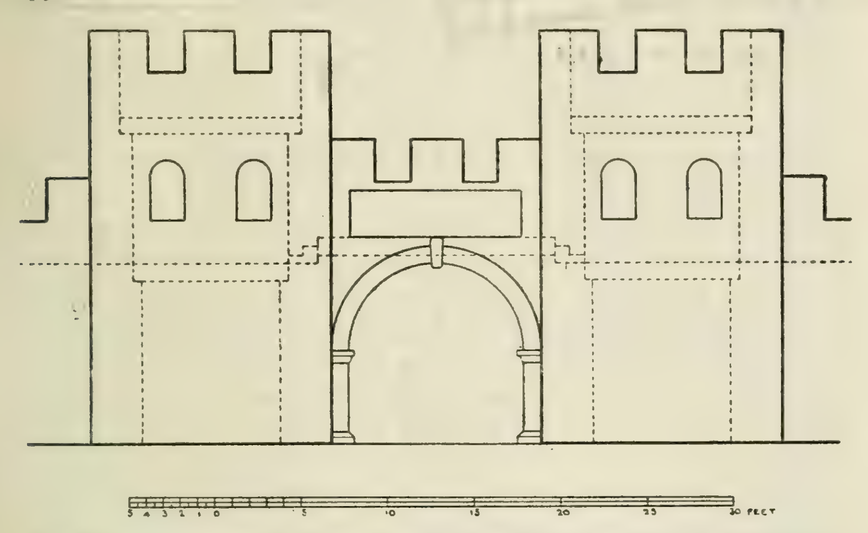


FIG. 6.—RESTORATION OF NORTH GATEWAY SHOWING TURRETS WITH FLAT ROOFS.

The Military Way, after passing through the Annexe, entered the East Gate, and traversed the Fort from east to west. On leaving the West Gate, it turned north-westwards to follow the line of the Vallum, its oblique course here being reflected by the finish of the west ditches north of the gateway. It appeared to have crossed the river to the east of the present bridge. As it passed through the Fort, it formed the *via principalis*,

[1] The dimensions given in the Plan to the streets and therefore to the spaces they enclosed are approximate. The edges of the streets were rather indeterminate. Where the gravel of a street showed distinctly, it was measured, and a uniform breadth assumed; but the gravel may have been spread out by the plough. Indeed traces of stones and gravel were found so widely spread throughout the Praetentura and Retentura as to give the impression that the street-plan might have been altered, a possibility also suggested by the positions of the street gutters. See pp. 39, 40-41.

dividing the interior into two unequal parts; its northern edge was about 150 ft. distant from the North Wall, while its southern edge was about 255 ft. distant from the South Wall. Adjoining it was the range of official buildings, occupying a strip about 90 ft. in breadth. Behind this, and parallel with the *via principalis*, ran another street, at right angles to which was the *via decumana* leading to the South Gate. A cross street intersecting it divided the rear portion of the Fort, the Retentura, into four rectangular blocks. The arrangement of the front part, or Praetentura, was similar, the *via praetoria* leading from the North Gate [1] to the central building being intersected by a cross street. Finally, inside the Fort wall, but at a distance of some 20 ft. from it, a street made the circuit of the interior, though at the north-east corner it had been encroached upon, during part of the occupation, by the projecting hypocaust of a bathhouse.

The Headquarters Building. In the centre of the range of stone buildings facing upon the *via principalis* stood the Headquarters Building (I).[2] Its outer walls measured 2 ft. 6 in. across their foundation course, which rested upon a band of cobbles and clay rather broader than itself and bedded some 9 in. into the natural soil. Of the masonry very little remained, but there were traces enough of the cobble foundation to give the dimensions and plan of the building; see Fig. 7. From east to west it measured 82 ft. over all; from north to south 86 ft., without counting the 4 ft. projection of the central chamber at the back. It was divided, in the usual manner, into outer court with wings, inner court and range of rooms. The outer court occupied nearly one-half of the interior area, the other half being divided about equally between the inner court and the range of rooms.

[1] Slight traces of this street could be followed from the North Gate to the point where the ground dips sharply to the river bed. There they stopped. Trenches carried down to the river on both sides of the line of the street proved that it had not turned either way.

[2] Praetorium or Principia. The fragmentary inscription found in 1911 in the well of the central building at Oehringen seems to be good evidence for "Praetorium." See Dessau, 9179*b*; Haug and Sixt, No. 600. Cf. v. Domaszewski's reading given *C.I.L.* xiii. 11759.

The outer court appeared to have been surfaced with gravel, of which some slight traces remained. Careful trenching proved that it had con-

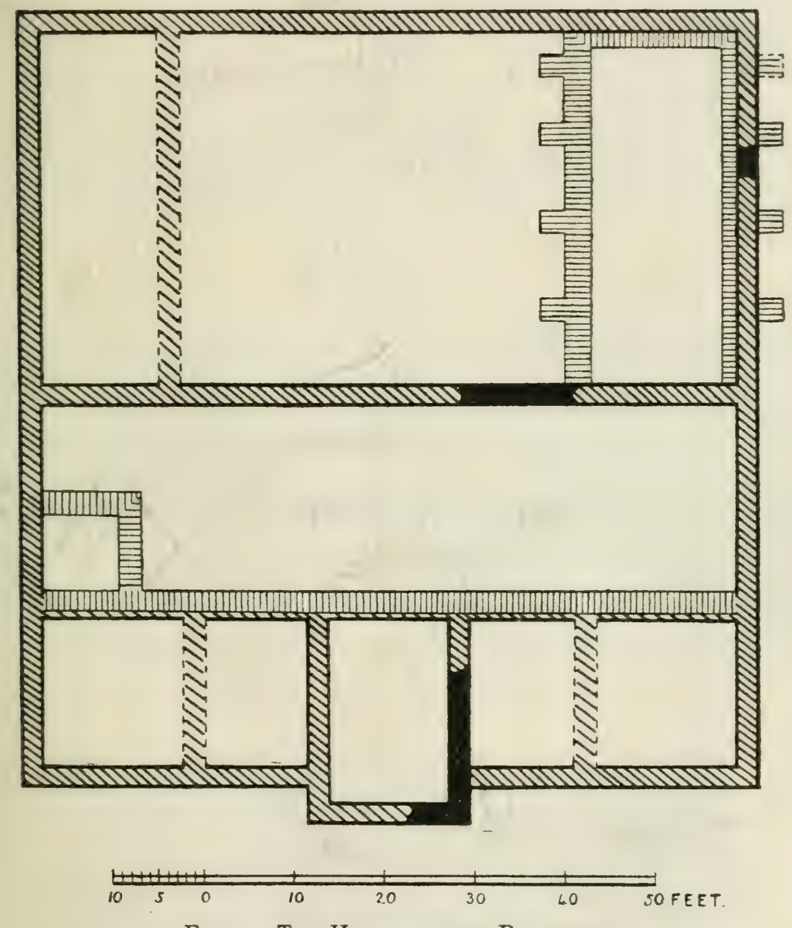


FIG. 7.—THE HEADQUARTERS BUILDING.

tained no well. The wall dividing it from the inner court may have been a later addition, as at Newstead and Birrens; the foundation was not so deep nor so solid as that of the main building, and a surviving portion

of the masonry showed inferior workmanship. Another foundation that was higher and slighter than that of the main walls was a band of cobbles which bounded the court on the west, running parallel to the outer wall at a distance of 13 ft. from it. If this continuous foundation carried the inner wall of a closed chamber, it can hardly have been part of the original plan of the Headquarters, since it differed from the adjacent foundations in level and structural character. On the other hand, it might be regarded as part of the original plan if it were supposed simply to have carried a dwarf wall supporting the uprights of a portico, as at Ambleside, Hardknott and Melandra.[1] That, however, was certainly not the purpose served by a corresponding, but heavier, cobble foundation which bounded the court on the east side at a distance of 16 ft. from the outer wall. This foundation, which was 3 ft. broad, showed periodic projections 2½ ft. sq. (Pl. VIII, *A*). It had carried the buttressed wall of a closed chamber. Corresponding buttresses had been built against the outer east wall, and to both outer walls in this wing an inner lining of masonry, from 1½ ft. to 2 ft. thick, had been added, probably to support a raised floor (Pl. VIII, *B*). Into this wing, then, a buttressed structure had been inserted. No doubt it had been some sort of storehouse. The corresponding part of the Praetorium at Lambaesis contained the *armamentaria*,[2] and there is some reason to believe that a similar arrangement was adopted in auxiliary *castella*.[3] It is, therefore, a reasonable supposition, though no objects were found to confirm it, that our buttressed structure had been built as a munitions store.

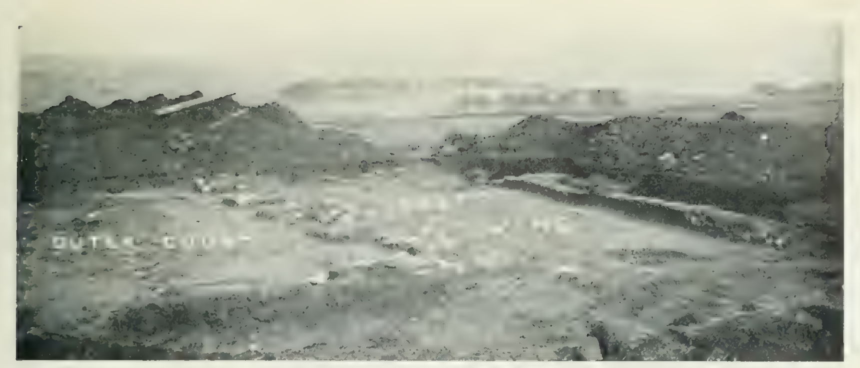
It seemed clear that this storehouse had been no part of the original plan of the Headquarters. The band of cobbles on which its inner wall had rested was laid at a higher level than the clay and cobble foundation of the outer walls, while the buttresses along the outer east wall, as well as the inner lining of stonework, were simply built against the wall and

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[1] *Ambleside II*, p. 19. See also *Slack*, Plan and pp. 20-21, for a foundation corresponding to ours and presenting the same ambiguity.

[2] Cagnat, *Les deux Camps à Lambèse*, pp. 43-46.

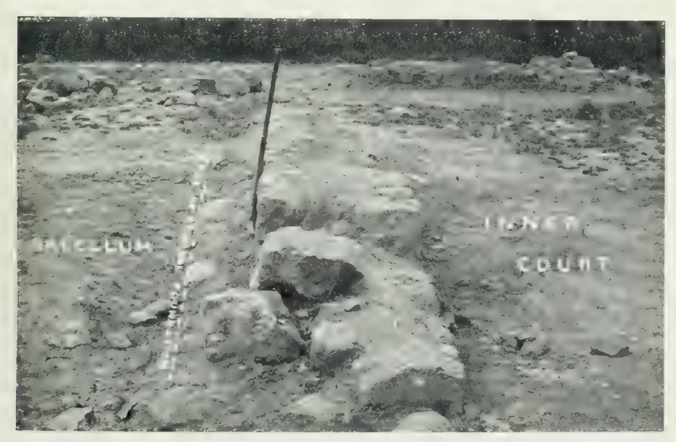
[3] *O.R.L.* 'Niederberg,' p. 2; 'Wiesbaden,' p. 26; *Niederbieber*, p. 266; etc. Cf. the Lanchester inscription, *C.I.L.* vii. 446. See Hettner, *Westd. Zeitschr.* xvii. p. 347.



A. North-eastern Part of Headquarters Building. Looking North-east.



B. East Wall of Headquarters Building. Looking South.



C. Rebuilt Wall in Headquarters Building. Looking West.

were not, like the granary buttresses (see below), bonded into the main structure. The storehouse may have replaced a lateral portico; the transformation of open porticoes into walled-in rooms was noted at Birrens and at Housesteads.[1] But though the change of plan, in our climate, was a natural one, the actual occasion for it, as for other alterations here, may have been given by the partial destruction of the building. That the interior had been wrecked at some time was shown by an examination of the wall at the back of the inner court. This wall had been run up upon an older foundation, but not square upon it. The inner edge of the later wall had been set back several inches from that of the older foundation, with the result that the outer edge lay clean off the foundation. The consequence was that the wall showed a decided cant outwards (Pl. VIII, *C*). Such a wall could not have been carried to any height. Presumably the rooms of the back range were low enough to invite this makeshift treatment, but it was curiously perfunctory work none the less.[2] The rebuilding of this wall upon the original foundation implies destruction and not mere alteration of plan.

It was probably when the back wall of the inner court was rebuilt that the small walled enclosure at the west end of the court was added. Certainly it was late work; the foundations, which were very flimsy, were simply placed on the floor level of the court. Small rooms of this kind inserted into the inner court of headquarters buildings are comparatively common. The purpose was presumably to provide a roofed chamber in a space that was open to the sky, and some fragments of roofing tiles found in our inner court must be supposed to have come from the roof of the adjoining rooms.

The back range consisted of the usual five rooms. The central room, or *sacellum*—the *domus verenda signorum*—had no apse, but was dis-

[1] *Birrens*, p. 114 and Plan; *Housesteads*, p. 212 and Plan.

[2] Or was it in expiation, *dicis causa*, of a *religio* that an ill-fated wall was rebuilt slightly off its original foundation? Is this the implication of *Ad Herenn.* IIII. li. 63?—*Quaerit in agris frumenta cuius modi sint, negat se, quia villae incensae sint, accedere posse, nec aedificare etiam nunc audere; "tametsi in Tusculano quidem coepi insanire et in isdem fundamentis aedificare."*

tinguished by being projected 4 ft. beyond the line of the main building, as at Gellygaer, the Saalburg and elsewhere. This central room was floored with masonry chippings laid in a bed of clay about 9 in. thick. Imbedded in the clay was a coin which may have been a legionary denarius of Mark Antony. No vault or pit had been sunk to safeguard the regimental purse deposited *apud signa.* A strongroom may, however, have been provided otherwise. The remains of the masonry of the rebuilt wall dividing the *sacellum* from the inner court still stood well above floor-level, so that if the *sacellum* was entered directly from the inner court, steps must have led up to the doorway. It is possible that the *sacellum*, in the latest period at all events, had had a raised floor of timber.[1] In that case the space beneath this floor might have served as a strongroom.

Besides roofing tiles and much window glass, the objects found in the Headquarters Building comprised four coins (including the denarius found in the *sacellum*), some bottle glass, a fair amount of pottery, both Samian and coarse ware, and (it may be added) an oyster shell.

The Granaries, etc. The Headquarters Building was flanked on either side by a buttressed storehouse or granary. Of that on the west (II) little was left. There were remains of three longitudinal dwarf walls which had supported the usual raised floor (Pl. IX, *A*). Nothing of the masonry remained except a small fragment of the east wall, 3 ft. thick. On the west wall a single survivor of the original series of buttresses remained *in situ*; it measured 2½ ft. sq. The foundation of clay and cobbles on which the masonry had rested did not contract between the buttresses, but maintained a uniform breadth of 5½ ft. It was well enough preserved to give the dimensions of the building, which had measured 84 ft. over all from north to south and 27 ft. from east to west.

The remains of the East Granary (III) were considerable (Pl. IX, *B*). Its walls were 3 ft. thick, while the buttresses measured 2½ ft. sq. at their second, or scarcement, course, the foundation course projecting some 6 in. on the three free sides. As in the West Granary, the band of clay and

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[1] A raised floor is supposed for the *sacellum* at Newstead (Curle, p. 55) and at a number of forts on the German Limes.

A. Remains of Dwarf Walls in West Granary. Looking South.



B. West Wall of East Granary. Looking South.

cobbles on which the masonry was laid did not contract between the buttresses, but kept a uniform breadth. Along the west wall this foundation was edged, between the buttresses, with laid stonework to provide the inner kerb of a gutter. From north to south the building measured 86 ft. over the walls (91 ft. over the buttresses) and 22 ft. (27 ft. over the buttresses) from east to west. As in the West Granary, three dwarf walls had run the length of the building to support a raised floor. Enough of the outer masonry survived to show one of the openings which had pierced the walls between each pair of buttresses ; this was the opening midway along the east wall between the fourth and fifth buttresses. It splayed inwards from about 9 in. to about 18 in. (Pl. X, *A*).

Between the two buttresses of the south wall, alongside the street behind the central buildings, were the remains of a loading platform, while into the northern end of the building a kiln had been inserted, having a narrow opening or flue through the outer wall, like a kiln in one of the granaries at Housesteads. It was sunk 2 ft. 9 in. deep, and was stone-bottomed (Pl. X, *B*).[1] The sides, which were of roughly-dressed stones, expanded a little as they rose, the bottom and top of the interior measuring, across their greatest diameter, about 6 ft. and 7 ft. respectively. At its inner (southern) margin, however, an inset of stonework contracted the interior diameter by over a foot. The insertion of kilns in granaries is explained by the practice of roasting grain, before grinding, to make it crisp and friable. The kiln was properly an adjunct of the mill, not of the granary—*messum far promendum hieme in pistrino ad torrendum, quod ad cibatum expeditum esse velis* ; [2] but in a frontier fort, where the men

[1] On the authority of Dr. John Buchanan, Stuart records that "in 1848 the farmer, while trenching the sloping field between the Kelvin and the rampart, came upon a mass of ruins, of circular shape and resembling the cradle of a well, within which was a quantity of blackish-coloured stuff, like charred wheat, and a coin of middle-brass of Antoninus Pius in fair preservation" (*Caled. Rom.* 2nd ed. p. 320). It seems probable that Stuart, speaking at second-hand, has somewhat misplaced the farmer's discovery, and that the structure he describes was really the granary kiln, or, less probably, a similar structure in the Commandant's House (see below). Careful trenching proved that no structure lay between the Fort and the river.

[2] Varro, *Res Rustica*, I. lxix. See a characteristic note in Henry's *Aeneidea*, i. pp. 478-9.

would do their own grinding with the hand-mill, or quern, a given ration, one may suppose, would be roasted in the granary before being issued.

In these buildings, especially in the east one (III), fragments of large storage vessels, amphorae and the like, were particularly abundant. There was also a fair amount of other common ware, as well as a little Samian ware, and some bottle glass. In the West Granary a "second brass" of Pius was picked up. In both, iron nails, pieces of roofing tiles and other building material lay among the debris.

The western end of the range of central buildings was occupied by two oblong structures, marked IV and V on the Plan (Pl. LVIII). The larger of these, that next the West Granary (IV), measured 93 ft. by 17 ft. over the walls; the smaller (V) measured 82 ft. by 15 ft. In No. IV a flue entered at the north-west corner, ran inside the north wall and could be traced for some feet along the east wall; round about were extensive traces of burning. The buildings contained some coarse pottery, including a few fragments of storage jars, but nothing that gave a definite clue to their purpose. Corresponding buildings elsewhere have been identified as the garrison *fabricae*. At Bar Hill, for example, the eastern end of the central range was occupied by a building which, like our No. IV, was entered by a flue and showed marks of burning; the objects found there indicated that it had served as a workshop.[1]

The Commandant's House. The east end of the central range was occupied by the type of building known as the Commandant's House (VI). The foundations of the main wall measured 2½ ft. across, and were of clay and cobbles. They showed that the building had measured, over the walls, 88 ft. from north to south and 78 ft. from east to west. The remains gave no more than a general idea of the ground-plan. The house had consisted of four ranges of rooms, giving inwards upon a roofed corridor or portico, which surrounded a central courtyard. See Fig. 8.

The courtyard measured 29 ft. by 26 ft. It was gravelled, and had been open to the sky; it contained no well. The surrounding corridor, which was floored with masonry chippings, was 6-7 ft. in breadth. A

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[1] *Bar Hill*, Pl. II and p. 44. Cf. *Niederbieber*, p. 268.

A. Splayed Opening in East Wall of East Granary.



B. Kiln in North End of East Granary.

foundation of a secondary nature was found to have been carried across it at the south-east corner. That the corridor had been covered with a sloping roof, whether a pentice roof or a continuation of the roof of the

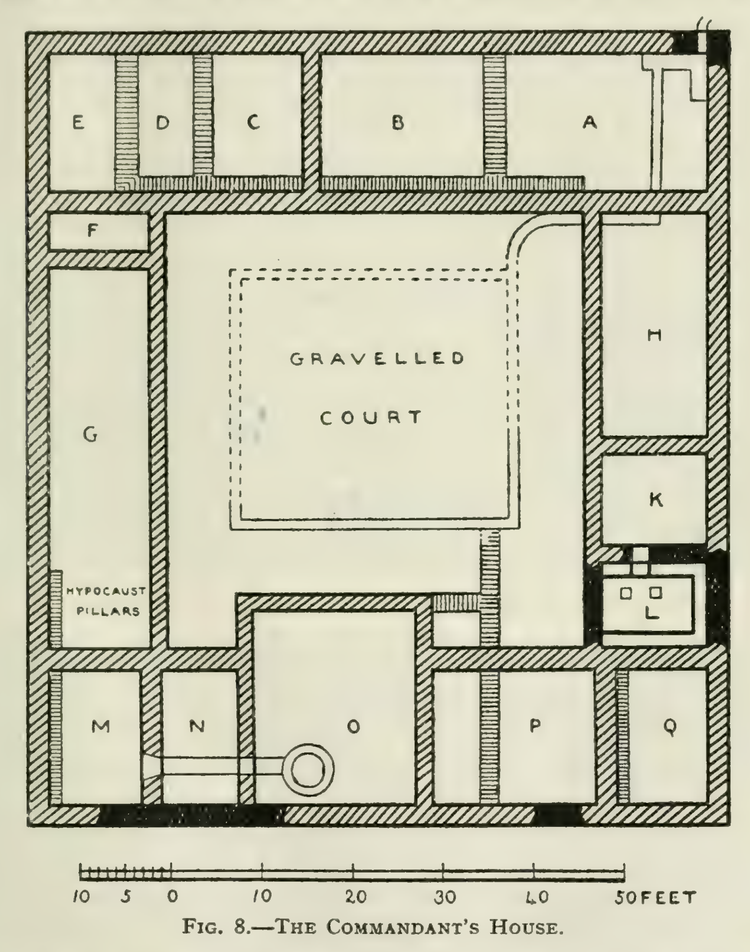


Fig. 8.—The Commandant's House.

main building, was proved by a well-constructed gutter, stone-bottomed and laid in puddled clay, which ran round the courtyard and issued at the north-east corner of the building, where it served to flush a small

latrine (Pl. XI, *A*). There was no trace of stone piers or of a continuous stone foundation alongside the gutter, nor could a series of post-holes be made out. Timber posts might have been mortised into a wooden sleeper, but for a roof with a 6-7 ft. projection struts would be sufficient support.

Of the four ranges of rooms those on the south and north were wider by a few feet than those on the east and west, their interior measurement being 14-15 ft. as compared with 11-12 ft. One of the two compartments on the west side (*F*) had an interior width of only 4 ft. There was nothing to show that the two foundations enclosing this narrow space were not contemporaneous, and similar passage-like compartments occur in the corresponding buildings at Newstead, Housesteads and elsewhere. The other compartment of this range (*G*) was, if undivided, no less than 42 ft. in length. There may have been a partition which had left no trace. That is the more probable since this part of the building had been heated; at the southern end lay tumbled hypocaust pillars of stone. The hypocaust had been heated from the adjoining room (*M*) at the western end of the south range. Hereabout there were abundant traces of burning and a few fragments of flue-tiles.

On the east, the middle room of three (*K*) communicated by a flue with a hypocaust adjoining it on the south (*L*). Here also fragments of flue-tiles were found as well as two stone pillars. This hypocaust had been sunk to a depth of quite 3 ft.—considerably below the foundation-level of the main outer wall as well as of the two dividing walls. Accordingly, these three walls, from the floor-level down to the bottom of the hypocaust, had been supplemented with a lining of stonework, 12-18 in. in thickness, which, besides serving as a revetment to the subsoil, would carry the ends of the flags spanning the hypocaust pillars (Pl. XI, *B*). This inner lining formed one structure with the back wall of the room, which was itself carried down to the full depth of the hypocaust. If the furnace had been outside this back wall, it had left no apparent trace of itself. Possibly the insertion of a hypocaust here had been an afterthought.

The central room of the south range (*O*) projected inwards some 6 ft.

A. Latrine in North-east Corner of Commandant's House.



B. Hypocaust in East Range of Rooms of Commandant's House.

A. KILN IN COMMANDANT'S HOUSE.

B. WEST WALL OF COMMANDANT'S HOUSE. LOOKING NORTH FROM SOUTH-WEST CORNER OF BUILDING.

It contained a circular basin, stone-bottomed and stone-lined, sunk in the floor to a depth of 2½ ft. (Pl. XII, *A*). It expanded as it rose from less than 4 ft. in diameter at the bottom to over 5 ft. in diameter at the top. It had not been fired direct ; it had been heated by means of a flue from the chamber at the western end of the range (*M*), from which, as has been explained, the adjoining hypocaust on the north had also been heated. This circular enclosure had been a drying oven or kiln, employed, no doubt, for a variety of domestic purposes—drying grain, fuel, clothes and the like.

Before the end of the occupation, the hypocaust in the east range had been disused and filled up with clay. This was not the only evidence of change. A foundation was found to have been laid alongside the original wall dividing rooms *P* and *Q*. On the west side of the building, an inner foundation could be traced alongside the outer wall for nearly a third of its length (Pl. XII, *B*), and a similar foundation, with dividing walls running into it, lay inside the back wall of the north range (Pl. XIII, *A*). All those foundations were of a secondary character ; they were not laid so deep as the foundations of the main walls, and they were made up of broken sandstone in place of cobbles. Such foundations recall the secondary work alongside the original walls at Birrens. In our building, however, it is possible that they had been added to support raised timber floors. More significant was an alteration of the central room (*O*) of the south range. At some time this room had been enlarged at the expense of the corridor and of the adjoining room on the east (*P*). A late floor, continued over the original dividing wall on the east to the new dividing wall, was indicated by a spread of pounded brick, mixed with some gravel, upon a bed of broken stones, 6-9 in. thick, the gravel and pounded brick apparently representing the aggregate of a concrete from which the limy constituent had disappeared. It is highly improbable that such fundamental reconstruction would have been undertaken merely to gain a few feet of extra space. Here it looks as if occasion for rebuilding had been given by the destruction of this part of the building.

Besides flue-tiles, iron nails, window glass and such-like building material, the objects found in the House included a good deal of coarse ware (though

almost no Samian ware), the pounding stone of a mortar and a stone spindle-whorl.

The Barracks, etc. At the time when a stop had to be put to the excavations, the details of the barracks had still to be worked out. Since these structures were not of stone, this could have been done only by uncovering them completely and testing every foot of the soil. As it was, there was no time to uncover more than a single specimen—Block IX. The distribution and dimensions of the others were determined by tracing the surrounding streets and running exploratory trenches across the intervening spaces. The dimensions given to them in the Plan (Pl. LVIII) are to be taken as approximate only, for the edges of the streets were rather ill-defined. Indeed traces of street gravel were so widely spread as to suggest that in the earlier part of the occupation the arrangement of the streets and barracks might have differed from the final plan as excavation revealed it—a surmise strengthened by the varying positions of the street gutters (see below). This is a matter we shall have to return to when we come to discuss, in the light of the evidence as a whole, the character of the unit or units that may have garrisoned the fort (see pp. 106-9). Meanwhile we confine our attention to the scheme of barracks actually retraced by our trenches.

The Praetentura was found to be divided by its rectangular street-plan into four blocks of barracks, numbered VII-X on the Plan. Block VII measured about 130 ft. by 40 ft., No. VIII 147 ft. by 40 ft., No. IX 130 ft. by 40-43 ft., and No. X 147 ft. by 43 ft. The Retentura was similarly divided into four blocks, numbered XI-XIV on the Plan. Block XI measured about 138 ft. by 38 ft., No. XII 152 ft. by 38 ft., No. XIII 138 ft. by 20 ft., and No. XIV 152 ft. by 19 ft. That is to say, there were six blocks of roughly the same size, averaging about 140 ft. by 40 ft., and two blocks of about half that size, having the same length but only half the breadth.

The six larger blocks are paralleled by similar blocks at Housesteads, Gellygaer and elsewhere. To judge by analogy, they were *hemistrigia*, designed to accommodate a century each, so that together they would supply quarters for the six centuries of an auxiliary *cohors quingenaria*. The half-



A. North Range of Rooms of Commandant's House. Looking East.



B. Oven inside South Wall of Fort.

sized blocks, XIII and XIV, are still to account for. The explanation that best suits their shape and size is that they were stables.[1] In that case, the natural inference would be that our cohort was *equitata*—comprised, that is, 120 *equites* to (probably) 360 *pedites*. Together the blocks would give almost exactly the same space as a double block at Gellygaer (*Gellygaer*, Plan, No. IX) which is generally regarded as the stables of the *cohors quingenaria equitata* assumed to have been the garrison there. In each case, the accommodation would, in fact, be just enough for the horses of the mounted contingent of a cohort of that size. On the other hand, the supposition that the blocks would stable beasts of burden could not be supported by any such calculation. We do not know how many of these animals were maintained in a cohort-fort. We cannot even be certain that they were always kept within the *enceinte*, though that would be an obvious precaution to take against possible raids. In any case, there is nothing to show that substantial blocks of stables were built for them, even in a legionary *castra*. At Novaesium it is supposed that they were tethered under the verandahs running along each side of the streets upon which the *hemistrigia* opened. That a similar arrangement may have been adopted in auxiliary *castella* is suggested by the considerable breadth commonly given in our forts to the spaces round the *hemistrigia*—and the area of our forts, compared with the units they accommodated, was too restricted to allow of any waste of space. A common breadth is 20-25 ft., which would give room, on about the same scale as at Novaesium, for a single row of baggage animals as well as a street (10 ft. + 15 ft.). Verandahs (if one must suppose the animals to have been put under cover) may well have been present where no trace of such was noted.

The probability, then, is that blocks XIII and XIV would accommodate the horses of a mounted contingent. Let us see what this supposition

[1] Haverfield, *Roman Britain in 1913*, pp. 10-11. Among our finds there was little to indicate the presence of horses. Besides a ring which may have been a terret (Pl. LIII, No. 12), there was only one tiny fragment of evidence. It was the upper molar tooth of a horse (App. B, No. 5). It was picked up in the drain behind Block XIV. At Birrens and Castlecary, little that suggested horses would appear to have been noted, yet Birrens was garrisoned by a *cohors equitata miliaria*, and so also, during part of the occupation, was Castlecary.

involves. If our cohort was *equitata*, we should have to assume the mounted men to have been quartered along with the infantry in the centurial blocks, since blocks XIII and XIV could not have accommodated the *equites* as well as their mounts.[1] Again, if the centuries of a *cohors equitata* were of about equal strength (60 men each), we should have to assume the *equites* to have been distributed over the centurial blocks equally, since these blocks are all of much the same size. The same assumptions are involved in supposing Gellygaer to have been garrisoned by a *cohors equitata*, since the only blocks there definitely recognisable as barracks are the six equal-sized centurial blocks. In each case we should have to assume 20 mounted men to have been assigned to each century, whether we reckoned the number of *turmae* at six or four.[2] If there were six *turmae*, the number would correspond to the number of centuries ; if there were four, an equal distribution over the centuries would mean that the tactical organization of the *equites* was not maintained in permanent quarters ; in either case the effect would be the same—the organization of the *equites* would conform to the centurial organization of the cohort. In this there is nothing improbable. It may be the explanation of such epigraphic evidence as the Coptos inscription, where the centurions of certain *cohortes equitatae* contributing to a vexillation are given without any mention of the decurions.[3] Anyhow it would be a natural arrangement in a permanent cohort-fort,

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[1] Nor could one suppose that these blocks were the quarters of the *equites* themselves, and that their horses were otherwise provided for. That would be to allow the *eques* half the accommodation of the *pedes*.

[2] In the *De Munitionibus Castrorum* the number of *turmae* was given for a *cohors equitata miliaria*, but it has unfortunately disappeared in a lacuna (c. 27). V. Domaszewski points out (Hyginus, p. 50) that it suits the author's reckoning best to suppose that the number given was ten (not eight) ; that is, a *turma* for each century. In that case analogy would indicate six *turmae* for the *cohors equitata quingenaria*. On the other hand, there is a certain amount of evidence that points rather to four *turmae* of 30 men each ; see Mommsen, *Eph. Epig.* vii. pp. 462-3. The direct evidence for four *turmae*, however, is slight, and the matter hardly seems to admit as yet of a definite decision.

[3] *C.I.L.* iii. 6627. In the composite *exercitus* referred to in Vegetius, iii. 8, *equites* seem to be attached to centuries : *De singulis centuriis quaterni equites et quaterni pedites excubitum noctibus faciunt.* See below, p. 35, n. 1.

however it might be in a vexillation, that the *equites cohortales* should conform to the centurial organization. They did not compose a cavalry unit. They were mounted infantry, a mounted proportion of the cohort, and in normal circumstances they would be serving the general purposes of the cohort.[1]

The supposition, then, that our cohort was *equitata* would explain the two half-sized blocks without involving us in any improbable assumption as to the barracks arrangements. We might be in a position to settle the matter beyond question if we knew, in some detail, the internal arrangement of the blocks. Unfortunately, in the only one that was uncovered a longitudinal division was all that could be made out. That block was No. IX. The floor was of beaten earth, hardened with masonry chippings. Here and there were patches of burnt clay and stones, measuring 1½-2 ft. across; probably these were the vestiges of small hearths. Several rows were discovered of post-holes in which wooden uprights had been set. The holes measured, as a rule, about 1½ ft. across by 2 ft. deep. Besides the stones which had been packed round the beams, they contained traces of the beams themselves in the form of fragments of black wood, which were "no doubt the remains of ancient timber."[2] There were five rows of post-holes (Pl. LVIII). Row *B-B* was 5-7 ft. behind *A-A*, *C-C* was

[1] That they were not cavalry in the same sense as the *equites alares* is implied in Hadrian's allocution to the African army: *Difficile est cohortales equites etiam per se placere, difficilius post alarem exercitationem non displicere . . . equorum forma, armorum cultus pro stipendi modo* (*C.I.L.* viii. 2532, 18042); see Mommsen, *Eph. Epig.* vii. p. 465.

In so far as they did not compose a cavalry unit or subunit, their position was somewhat analogous to that of the legionary *equites*. It seems clear from our lists (cf. *C.I.L.* iii. 6178; viii. 2567) that the legionary *equites* were divided up among the cohorts. That they were further distributed over the centuries is indicated by *C.I.L.* viii. 2593 (where there seems no real reason to question the centurial sign): *Ael. Severus eq. leg. iii Aug., Ɔ. Iuli Candidi*. See also the passage cited above from Vegetius, which apparently refers to both legionaries and auxiliaries. It may be added that if v. Domaszewski's Trajanic date for the *De Munit. Castr.* be accepted, Hyginus' silence about the legionary *equites* would naturally be taken to imply that they were quartered with the infantry (v. Domaszewski, Hyginus, p. 70).

[2] Report from Professor J. W. Gregory.

14 ft. behind *B-B*, *D-D* 5·6 ft. behind *C-C*, and *E-E* 16 ft. behind *D-D*. An obvious interpretation of this would be that our block had been divided by a longitudinal passage into two limbs and supplemented by a verandah along its north side. Indeed, since row *B-B* appeared to terminate some 25 ft. from the western end, we might suppose a projecting head at that end, the line of which would be continued by the verandah.

That there had been a verandah along the rampart side of our block is not impossible. If it would imply that there had been entrances on that side, reference might be made to Housesteads; there, indeed, *all* the entrances of the outer blocks were on the rampart side. Moreover, a verandah on the rampart side of a barrack block has recently been noted at Slack.[1] Still, our scheme of post-holes is hardly enough of itself to prove such a verandah. It might be thought that on the opposite side of the fort a verandah next the rampart was implied by the length of gutter running 10 ft. to the south of Block XI. That gutter, however, if it indicated a verandah, would equally indicate that the full breadth of the 40 ft. space behind had been occupied by the main structure, and so would go to disprove, rather than confirm, the supposition that row *A-A* of Block IX represented the line of a verandah. The truth is that in each case the presence of a verandah is very doubtful. A verandah next the rampart, though not unexampled, was not the normal arrangement. The question arises whether all the rows of post-holes had belonged to the original plan of our block. The cobbles and gravel of the street inside the rampart undoubtedly projected a little over row *A-A*. Moreover, the mass of stones found in the holes of this row was such as to suggest a filling rather than a mere packing for uprights, and along with these stones one or two fragments of pottery were cleared out as well as the bronze ring with enamel decoration described on p. 96. These indications, though not conclusive, suggested that row *A-A* might have been filled up and the street carried over it. That might mean, not that a verandah had been removed, but that row *A-A* represented the original line of the main structure, and that it had been replaced by row *B-B*—that the block,

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[1] *Slack*, Plan, No. IX.

that is, had been reconstructed with a diminished breadth. In that case we should have only four rows in use at one time, and our verandah would disappear.

If row *B-B* replaced row *A-A*, it is just possible that row *D-D* might have been dug at the same time to replace row *C-C*, in which case not only would our verandah disappear but the longitudinal division of the block would take the form of a simple wall instead of a passage. In any case, the division of our block into two limbs, with or without an intervening passage, is certain.[1] At Niederbieber, where spaces of *hemistrigium* size were divided into two limbs, each limb, it is supposed, accommodated a certain number of *contubernia*. There, however, the HALF-*hemistrigia* are taken to have faced one another and the *hemistrigia* to have been set back to back; in other words, spaces of *hemistrigium* size are supposed to have been treated as *strigae*, and the usual arrangement worked out on half-scale.[2] Niederbieber was garrisoned by *numeri*. In the normal cohort barracks, where the *hemistrigia* face one another across the intervening streets, the space allotted to each *contubernium* occupies the full breadth of the *hemistrigium*. If we assumed that to have been the case at Balmuildy, we should have two compartments for each *contubernium*—an arrangement analogous to that found at Novaesium, Lauriacum and Lambaesis.[3] That some such arrangement was, in fact, adopted in auxiliary

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[1] Block I at Housesteads is an instance of a *hemistrigium* divided by a longitudinal wall. At Birrens the *hemistrigia* in the Retentura are in two limbs separated by a narrow passage or eavesdrop. This assumes that Blocks XVI and XXIII there were isolated half-sized blocks, like our XIII and XIV, and that Blocks XVII-XVIII, XXIV-XXV, etc., composed the *hemistrigia*. Otherwise we should have to suppose for Birrens the same arrangement as is assumed for Niederbieber—not a normal arrangement, as is pointed out in the text, for cohort barracks.

[2] *Niederbieber*, p. 271, Fig. 2. See pp. 270-272 for the argument based on two sizes of hearth. It might equally be argued, however, that each pair of hearths, a large and a small, indicated that each *contubernium* had had two rooms, differently employed or housing different groups of the *contubernium*. In that case, the general arrangement would be the same as at Balmuildy, and the *hemistrigia* would face one another in the usual way.

[3] *Bonn. Jahrb.* 111-2, Pls. IV-V; *Der römische Limes in Österreich*, viii. Pl. II; Cagnat, *Les deux Camps à Lambèse*, p. 49, Fig. 3.

castella as well as in legionary *castra* is indicated by the divisions noted in more than one of the *hemistrigia* at Housesteads.[1] In any case it can safely be assumed that each limb of our Block IX had been divided up by partitions. These, however, having been of wood, had entirely disappeared. With their help we might have been able to say definitely whether the block housed *pedites* only or *pedites* and *equites*, and how, if it was occupied by a mixed lot, the *pedites* and *equites* were distributed over the rooms. As it is, the most that we can say is that at the time the fort was abandoned the garrison was probably a *cohors quingenaria equitata*.[2]

The presumption is that all the larger blocks had been divided longitudinally like No. IX. Certainly that block can be taken as representative of the general character of our barracks. All had had floors of beaten earth, hardened with masonry chippings. All had been wooden structures ; here and there our exploratory trenches turned up fragments of decayed or charred wood, and iron nails were comparatively common. No trace of masonry was met with except at one point. At the north edge of Block VII, near its western end, was a short length of laid stonework. Alongside of it, but within the actual barrack block, lay two stone hypocaust pillars and a fragment of a flue-tile. It looked as if a hypocaust had been installed here, in which case the adjoining stonework, if it was not a mere remnant of a drain, might have been connected with the provision of a furnace. The fact that the building itself was of wood does not altogether exclude the possibility that a hypocaust of a sort had been fitted into it. On the other hand, one might have expected a hypocaust to have left more trace of itself than two pillars and a fragment of tile ; and though these three objects could hardly have been brought here together by mere accident, they might possibly represent debris removed from another building to provide a fireplace. If they were the remains of a hypocaust, they would point to the officers' quarters having been next the rampart, as at Gellygaer (the usual arrangement), and not, as at Niederbieber,[3] next the *via praetoria*.

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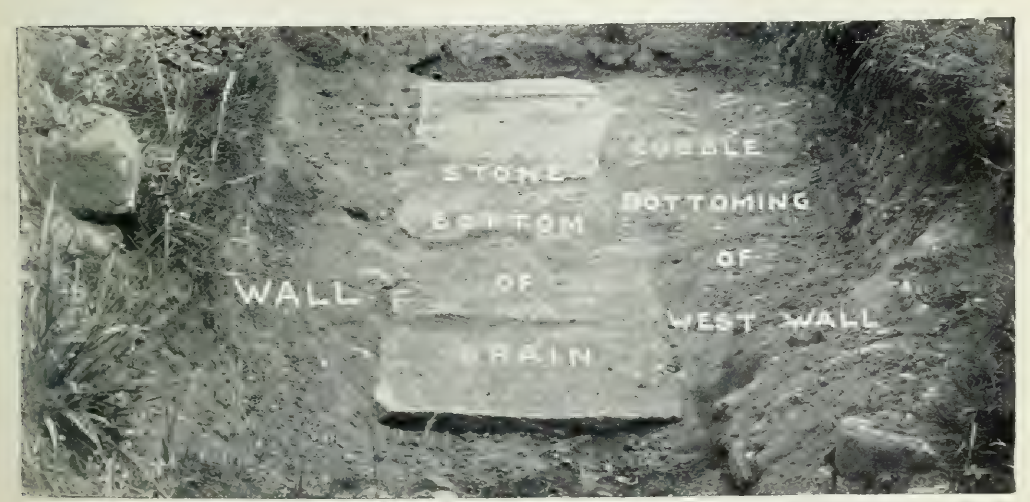
[1] *Housesteads*, Plan and pp. 231-2.

[2] See also p. 106, n. 3.

[3] For the hypocausted barracks there see *Niederbieber*, p. 272.



A. Drain from Commandant's House to North-east Corner of Fort.



B. Drain behind Central Buildings issuing through West Wall of Fort.

It was perhaps from officers' quarters that three fragments of window glass came that were found within the barracks area—two in the Praetentura and one in the Retentura. Certainly glazed windows had been quite exceptional in the barracks, and possibly the presence of these fragments within this area was accidental. Roofing tiles were entirely absent hereabout. The barracks must have been covered with wood or thatch, an operation which would be simplified by the longitudinal division of the blocks.

Had our barracks had verandahs in the normal position—that is, alongside the streets separating the *hemistrigia*? A search was made for such a verandah on the south side of Block IX, but no trace of one was discovered. For the other blocks we have nothing to go by except some lengths of gutter, and their evidence is contradictory. It will be seen that they do not occupy a uniform position in relation to the adjacent blocks, and it is possible that they do not all belong to one period. Certainly the two gutters between Blocks VIII and X, as we shall see presently, were of different periods.

Besides the building material referred to and a number of ballista balls (almost all near the north rampart), the barracks area yielded a good deal of Samian ware as well as much coarse ware, some bottle glass, a stone mortar, whetstones, the bronze ring already mentioned, a number of clay marbles and a small circular disk of earthenware, like a counter for some game.

The garrison cooking had been done behind the rampart. In the north-east corner ox bones were found in a mass of soot which had come from the furnace of the adjoining bathhouse (XV).[1] But most of the cooking had been done where shelter was to be had from the prevailing (S.W.) wind. Fragments of ox bones were found in the north-west corner, and in the west ditches between that corner and the West Gateway,[2] and it has been explained (p. 9) that along this section a band of carbonaceous matter ran behind the rampart; it contained, mixed with fragments of coarse cooking-ware, "pieces of carbonised wood, like faggot-wood, one

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[1] Appendix B, Nos. 8-9. [2] Appendix B, Nos. 1-4.

piece showing traces of a cut by a knife."[1] Immediately behind the South Wall of the Fort were the remains of a circular oven of the ordinary pattern, measuring 7 ft. across its floor, which consisted of a single slab of stone. Little was left of the masonry of the domed superstructure (Pl. XIII, *B*).

The Drainage of the Fort. The main drains of the Fort, such as that behind the central buildings and those issuing at the north-west and north-east corners, were nearly 2 ft. in depth, with sides of roughly-coursed masonry (Pl. XIV, *A*). Where they passed out through the Fort walls, they were stone-bottomed ; elsewhere the bottom appeared to have been simply the hard subsoil. These main drains were 2 ft. broad, and had been covered with stone flags. The ordinary street gutters were smaller and of slighter construction (Pl. XV), and they did not appear to have been covered.

The surviving lengths of drain, though fragmentary, were enough to indicate the way in which the drainage of the Fort had been planned. The Retentura sloped west. Accordingly, the drains discharged into the west ditches. The principal drain here was that behind the central buildings, which passed out through the West Wall over carefully laid flags (Pl. XIV, *B*). The drainage of the Praetentura was carried down the northern slope. A drain passed westwards along the northern edge of the *via principalis*, and then turned north and divided into two branches, one passing straight out through the North Wall, the other zigzagging to the north-west corner. Into this drain the minor drains of the western half of the Praetentura must have discharged. Those in the eastern half of the Praetentura had issued through the North Wall at the north-east corner.

We have suggested that the street gutters, which occupied varying positions in relation to the street edges and the adjacent blocks, may have represented more than one period. That is certainly the explanation of the duplication of gutters between Blocks VIII and X. The gutter running along the edge of No. VIII, in being diverted northwards, blocked the gutter running south of No. X (Pl. XV) as well as a drain crossing the

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[1] Report from Professor J. W. Gregory.



Street Gutters between Blocks VIII and X. Looking West.

street at its eastern end. It was presumably into this latter drain that the gutter north of Block VIII originally discharged. This drain, before it was disused, had probably issued from the Commandant's House. Latterly, the drain from the House had been given a zigzag course, this also cutting across an existing drain (Pl. XVI, *A*). At the same time it had been raised in level, resting now upon a considerable depth of forced earth. This alteration must have been connected with a reconstruction, to be described presently, of the street which it drained and of the adjoining bathhouse (XV).

On the analogy of Bar Hill and other forts, one would have expected the garrison latrine to have been in this (the north-east) corner, where the waste water from the bathhouse could have been utilised for flushing purposes, supplemented by the discharge of several converging drains. No trace of one was found. It is possible that it may have been completely obliterated, especially as the adjoining bathhouse, as we shall see, had not only been reconstructed but finally demolished altogether. If there was ever a latrine in this corner, it can only have been a small, and was presumably a slight, structure. It can hardly have been in use in the latest period of the occupation, and there was really nothing to prove that one had ever existed here at all. The only thing of the kind discovered in the interior of the Fort was the small latrine, already referred to, in the north-east corner of the Commandant's House.[1]

The Fort Bathhouse (XV). There was a bathhouse inside the Fort as well as one outside.[2] That within the Fort occupied the north-east corner alongside the East Wall (Fig. 9; Pl. XVI, *B*). Its length was 68 ft. over

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[1] P. 30. See also pp. 5-6.

[2] Distinguished here, for convenience, as the Fort Bathhouse and the Annexe Bathhouse respectively. The distinction has reference solely to their situation.

At Chesters there appears to have been a bathhouse inside the east rampart as well as one outside the fort. At the Saalburg there was a bathhouse in the Retentura of the fort as well as one in the Annexe. But bathhouses have seldom been found inside the forts of the German Limes. For the few instances see *O.R.L.* 'Köngen,' p. 18, n. 1. There it is suggested that the inclusion of a bathhouse within the *enceinte* of the East Fort at Welzheim may have been due to that fort being outside the Pfahl. On our Limes also, the building of small bathhouses within the fort defences,

the walls; the breadth was 16 ft., except at the southern end, where room *A* projected over 1 ft. on the east, while on the west a further 13 ft. was added to the breadth by a projecting hypocaust (*E*), 17 ft. in length. Across their foundations the walls measured, on an average, 2½ ft.; they rested upon the usual band of cobbles and clay. The building was of a simple rectangular pattern, characteristic of a well-defined class of military bathhouse, found at Vielbrunn, Jagsthausen, Wörth and elsewhere on the German Limes. In Britain an example occurs at Hardknott, in Cumberland. From a paved court on the south, a room (*A*) was entered which contained a bath. Then came a series of three hypocausts (*B*, *C*, *D*), which had been heated from a furnace at the northern end. Adjoining the first room (*A*) on the west was a projecting hypocaust (*E*), which appeared to have been heated independently.

A length of earthenware piping and two grooved stones in which piping had been laid proved that a supply of water had been laid on.[1] There may have been a tank close by—there would be no lack of rain-water. Other building material comprised a cornice moulding and chamfered plinths as well as stone hypocaust pillars, lumps of concrete flooring, flue-tiles, pieces of window glass and iron nails and holdfasts. There was a considerable amount of pottery, both Samian ware and coarse ware. Of

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as at Balmuildy, Bar Hill and Castlecary, may testify to a feeling of insecurity. It might appear that, when placed alongside the rampart as at Balmuildy, they would interfere with the manning of the *enceinte*, but this would not be the case if, as we have suggested above (p. 11, n. 2), our bathhouse was a low building covered with a flat timber roof.

[1] The piping was found outside the south-west corner of the bathroom (*A*), while the stones lay in the adjoining courtyard. They are shown together on Pl. XVII, *A*. The length of water-pipe measures 16½ in. Its greatest external diameter is 5½ in. The internal diameter is under 3 in. It is jointed at one end (*tubulus lingulatus*) to fit into another length.

The stones are both 7 in. deep. They are carefully finished on the grooved face, one being tooled with a reticulated pattern. This latter measures 2 ft. 7 in. long by 1 ft. 4 in. broad. It is grooved lengthwise. The groove, which is 3½ in. wide, is only about ½ in. deep. The other stone measures 2 ft. 2 in. long by 13½ in. broad. It is grooved across the breadth. The groove is 7 in. wide by 1½ in. deep. On one side of this stone there is a dovetailed sinking in the groove for another block to be attached.

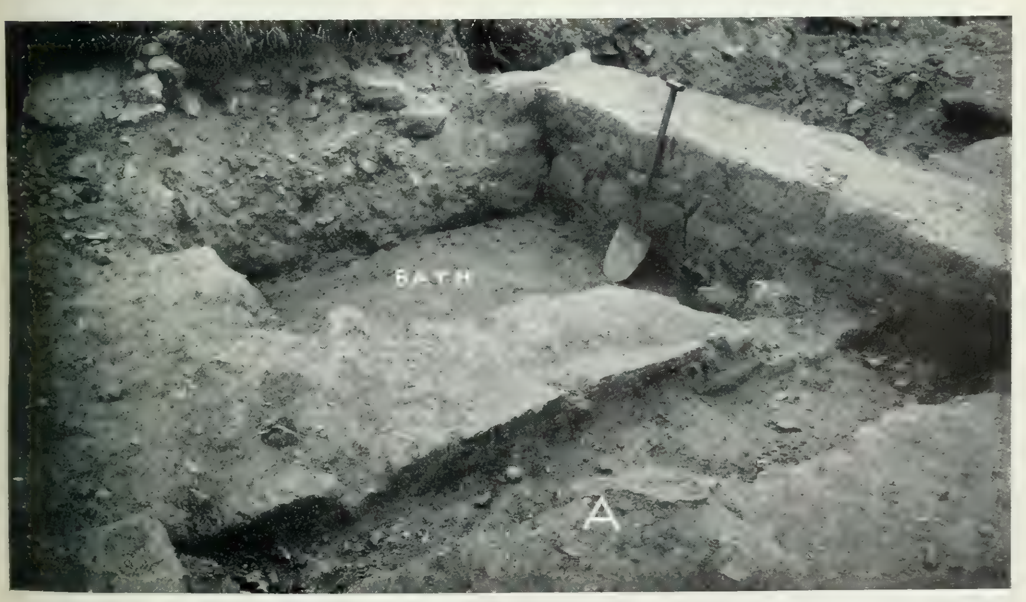
A. Later Course of Drain from Commandant's House cutting across existing Drain.



B. The Fort Bathhouse. Looking North-east.



A. Grooved Stones and Earthenware Waterpipe from Fort Bathhouse.



B. Entrance Room, with Bath, in Fort Bathhouse.

the small objects a few were articles of toilet—a bronze bow fibula, unguent pots of earthenware, a glass phial. A small stone disk appeared to have been a counter for some game, and it was from this Bathhouse, or its immediate neighbourhood, that most of our coins came. An altar found lying across the south wall of room *A*, alongside the courtyard, bore the customary dedication to Fortune (p. 59, No. 5).

The structural remains here, though they nowhere rose above floor-level, reflected more clearly and completely than any others those alternations of destruction and reconstruction which we have noted signs of elsewhere. This building, indeed, is the key to the successive phases the fort passed through, and on that account it requires a particular treatment.

The paved court from which it was entered was about 18 ft. square. A part of it next the Fort wall was taken up; underlying it, but separated from it by a foot or two of forced earth, was a *stratum* of masonry chippings, similar to that noted inside the North Wall of the Fort, with a "first brass" of Trajan lying beneath it. Immediately to the south of this court was a mass of wrought clay (Pl. XVI, *A*). No special provision for keeping the court dry seemed to be called for here, and we have suggested above (p. 8) that the clay may have been a surviving fragment of a backing to the Fort wall.

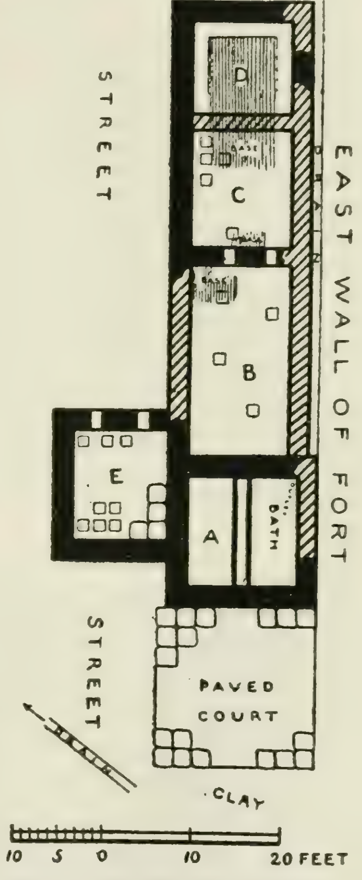


FIG. 9.—THE FORT BATHHOUSE.

The first room entered from the court (*A* : *Apodyterium* and *Frigidarium*)

contained a cold-water bath, which measured 12 ft. by 5 ft. and had been 2 ft. deep (Pl. XVII, *B*). Traces remained of a brick concrete with which the bath had been lined, and a cavity in its north-east corner showed that the water had been run off into a drain for which room was provided inside the Fort wall by the Bathhouse wall being set back 1 ft. or more from this point northwards. It was outside this room that the length of water-pipe referred to above was found. The room gave unmistakable evidence of alteration. The wall dividing it from *B* had been destroyed and repaired, a stone from a ruined cornice being now built into it (Pl. XVIII, *A*). And finally the bath had been filled up and sealed with clay.

The rebuilding of the bathroom wall and the disuse and filling up of the bath would naturally be taken to represent successive stages in the history of the room. This interpretation is confirmed by the evidence of rooms *B*, *C* and *D*, where the masonry was preserved to a greater height—or rather depth ; for since these rooms were hypocausts, they were founded lower than *A*, the change of level being negotiated by the walls being "stepped." In rooms *B* and *C* (*Tepidaria*), which communicated through two flues in their dividing wall, the evidence for more than one change was particularly clear. Originally their floors had been supported on stone pillars. At some time the rooms had been wrecked, the floors destroyed and many of the pillars smashed. To take their place, rude bases had been put together of clay and stones (including pieces of the broken pillars), and these had supplemented the surviving pillars to support a reconstructed floor (Pl. XVIII, *B*). The blackened condition of these bases showed that the rooms had still served as hypocausts ; they now resembled, in fact, a rude and irregular form of "channelled" hypocaust. But that did not last. Again the rooms were wrecked, and this time they were not rebuilt. The hypocausts were filled up to floor-level with the broken masonry of the fallen walls, heavier material below being systematically overspread with layers of small debris.[1]

The original plan of the small room at the northern end (*D* : *Caldarium*) is uncertain. When excavated, it was found to be occupied up to floor-

[1] For this filling see Pl. XX, *A*.

A. Rebuilt Wall in Fort Bathhouse.

B. Reconstructed Hypocausts in Fort Bathhouse. Looking North.



A. Room at North End of Fort Bathhouse. Looking South.

B. Reconstruction in Fort Bathhouse.

level by a solid mass of clay and stones, which, however, left room for a flue to run round inside the walls (Pl. XIX, *A*). This mass of clay and stones covered the footing of the wall dividing *D* from *C*, being indeed continuous with the similar base in *C*. The dividing wall, therefore, after being destroyed, had not been rebuilt. Too little of it remained to show the flue or flues by which *D* had communicated originally with *C* ; in its second period, when the wall was reduced to a mere footing, the heated air from *D*, as marks of soot showed, had passed *over* it (Pl. XIX, *B*). But once more that was not the last stage. Like *B* and *C*, *D* had ceased in the end to serve as a hypocaust, and the flue here, like the bath in *A*, had been filled up and sealed with clay.

The furnace had been at this (the lower) end of the building. No indication of it remained except some confused stonework and a mass of burnt stuff which lay between room *D* and the North Wall of the Fort. Among it was some coarse ware caked with soot and some fragments of ox bones.[1] A cookhouse here would be conveniently situated for fuel. Perhaps the Bathhouse furnace had itself been used for cooking as well as for heating the hypocausts.

The projecting hypocaust (*E*) had not been founded so low as rooms *B*, *C* and *D*, and the stone pillars supporting its floor were much smaller (Pl. XX, *A*). Part of the floor remained *in situ* ; the pillars were spanned with stone flags, on which lay traces of concrete. There was no sign of a flue communicating with *B*, and the hypocaust had apparently been heated direct by a furnace set against its north wall. This wall was pierced by two openings (Pl. XX, *B*). One of them (*a*), which had a stone gutter set in it, was presumably a drain, though the gutter would have served well enough for a flue ; the other (*b*) can only have been a flue. There was little or nothing left of a furnace, nor was there much sign of burning hereabout ; but before the end of the occupation this hypocaust (*Sudatorium*) was disused. At some time it was destroyed and not rebuilt, and the street which it had interrupted was then continued over its floor. The part of the floor still standing was found to be covered over with street

[1] Appendix B, No. 8.

gravel, while the ground immediately to the north had been made up to the floor-level of the hypocaust with a filling of clay. One of the openings in the north wall (*b*) was now filled up with a piece of masonry, while both openings were blocked with the clay packing. It was at this time, no doubt, that the drain from the Commandant's House was given its zigzag course through the street and correspondingly raised in level.

The demolition of this projecting hypocaust is probably to be connected with the first, rather than with the second, of the two destructions reflected in the remains of the main building. There was little reason, if all this area was already designed to be an open space, why part of it should have been spread with gravel (instead of small masonry debris) and differentiated as a street. It is more probable that when the street was carried over the ruined hypocaust, the main building had not yet been levelled. There was some direct evidence to confirm this view. For one thing, the pillars standing here *in situ* and the partially preserved floor contrasted with the complete levelling and systematic filling up of the main building after its second destruction. It looked as if by that time the floor of the projecting hypocaust already lay under the protection of the street. Again, immediately to the north of the hypocaust, the line of the west wall of the main range was the dividing line between the street gravel, with the clay filling it rested upon, and the filling of debris in hypocaust *B*. The wall must have been standing to some height when the clay filling was laid down and overspread with gravel.

We are now in a position to piece together the evidences of the remains in this corner. After the defences of the Fort had been completed, a bathhouse was inserted here. Whether or not its inclusion within the *enceinte* was due to a sense of insecurity being felt by the troops in their new surroundings—*ignota omnia circumspectantes*—there can be little doubt that its construction goes back to the beginning of the occupation. It was identical in the character of its masonry with the buildings of the central range, and was presumably erected at the same time. At some time during the occupation, the bathhouse was almost completely destroyed. It was repaired after a fashion, without being restored to anything like its former condition. The wall that separated the bathroom *A* from the

A. Projecting Hypocaust of Fort Bathhouse. Looking North-east.



B. Projecting Hypocaust of Fort Bathhouse. Looking South.

hypocausts was rebuilt with such material as lay to hand, a fragment of a ruined cornice now serving as a building stone. In the hypocausts themselves rude bases of stones and clay had to do duty for pillars as a support for the floors, while the wall dividing *C* from *D* was not rebuilt at all, these two rooms now forming one compartment. Neither was the projecting hypocaust (*E*) rebuilt; the street which it had interrupted was carried over its floor. In a second disaster the building again suffered. This time it was not repaired. The bath in *A*, the flue in *D* were sealed with clay, and the hypocausts were filled up to floor-level with the debris of their ruined walls. An altar lying face downwards across a fallen wall was overlooked or disregarded. Does this imply that, between the second destruction of the Bathhouse and the final levelling of the site, an interval had elapsed long enough for the altar to be forgotten, or even that the troops that levelled the site were not the same as those that had used the Bathhouse day by day before it was destroyed? When one remembers the scruples of the garrison at Bar Hill, such questions suggest themselves,[1] but obviously no certain answer can be given, and it will be well to exclude conjecture as far as possible from this summing-up. As a matter of fact, the evidences leave little room for guesswork. The exact place in the scheme of one or two of the details may be doubtful, but the outline is clear; the Bathhouse was wrecked and repaired, was again wrecked and this time was done away with, the ruins being levelled with the surrounding area.

The Annexe Bathhouse. The Annexe Bathhouse (XVI) lay outside the rampart at the south-east corner. It did not align with the Fort, but there is nothing unusual about that in an annexe bathhouse. The orientation

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[1] At Bar Hill an altar was found to have been thrown into the well, as if to save it from desecration (Macdonald, p. 402; *Bar Hill*, p. 133). The Bar Hill altar was a regimental dedication. Perhaps that would make a difference. At all events one may reasonably doubt whether the actual dedicator of the Balmuildy altar, Caecilius Nepos, would still be in command of the garrison when the Bathhouse site was levelled. This is a point worth noting, since the inference as to the garrison that one would naturally draw from Caecilius' rank (*tribunus*) is not that which one would draw from the barracks accommodation *as finally planned* (see below, pp. 106-7).

of ours, as it happens, conforms to the Vitruvian rule that the heated rooms should face south-west, but probably its alignment was, in fact, determined by structures already erected within the Annexe at right angles to the line followed through the enclosure by the Military Way (see the Plan—Pl. LVIII). The actual site selected for the building—over the Fort ditches—was more puzzling. Comment on that, however, had better stand over till we have completed our description of the structural remains. There was another feature we shall be in a better position to appreciate the significance of when the remains have been described. In clearing this area clay was encountered everywhere—not only in the immediate vicinity of the Bathhouse but over the actual site of the building itself. Here and there it showed distinctly as an artificial spread several inches thick.

This Bathhouse was more than half as large again as that within the Fort. Its walls, which were built upon the customary band of cobbles and clay, were unusually thick, averaging 3 ft. across their foundations. The structural remains, though they nowhere rose above floor-level, were exceptionally well preserved, and it was possible to lay down the ground-plan in some detail, except at points where trees and a farm wall obstructed excavation. The plan (Fig. 10) was more elaborate than that of the Fort Bathhouse, and more typical, apses being a feature of this building, as of most Roman bathhouses.[1] A portico or verandah may have been attached ; in a neighbouring part of the Annexe two stones were found mortised to receive wooden uprights (Pl. XXI, *A*).[2]

The entrance room (*A* : *Apodyterium* and *Frigidarium*) was at the south-east end of the building (Pl. XXI, *B*). It had been paved with carefully fitted stone flags, laid in clay. In the middle of the floor were the remains of a stone cradle or sink, with a circular cavity, about 1 ft. in

[1] For a strikingly close parallel to our plan see *Berichte R.-G.K.* 1910-11, p. 61, Fig. 6. This is a bathhouse attached to a villa at Pforzheim on the Enz (Baden).

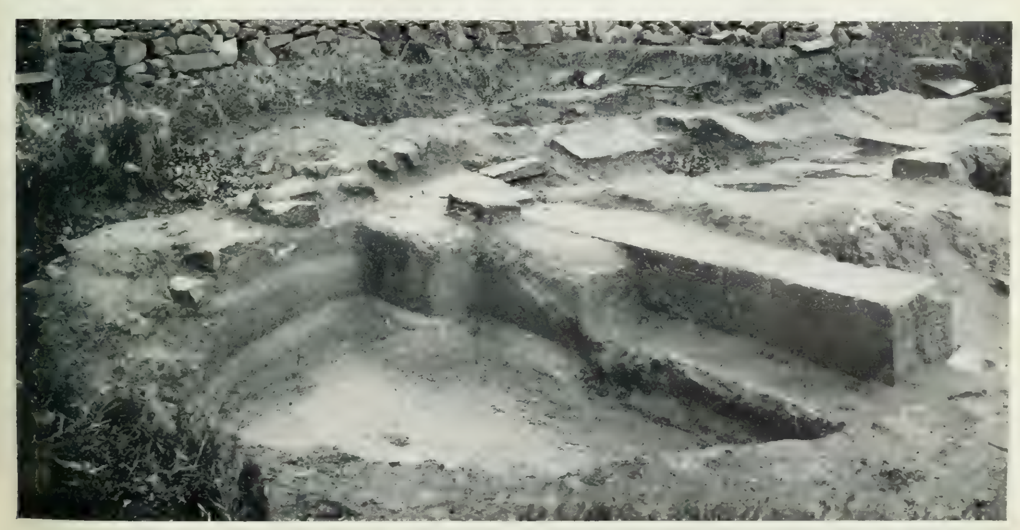
[2] The finding of a similar stone near the entrance of the bathhouse at Kapersburg may be noted as confirming the view that our stone belonged to the Bathhouse (*O.R.L.* ' Kapersburg,' pp. 15-16).



A. Stones mortised to receive Wooden Uprights. From Annexe, near Bathhouse.



B. Room with Bath in Annexe Bathhouse.



C. Apse, containing Bath, off Room *A* in Annexe Bathhouse.

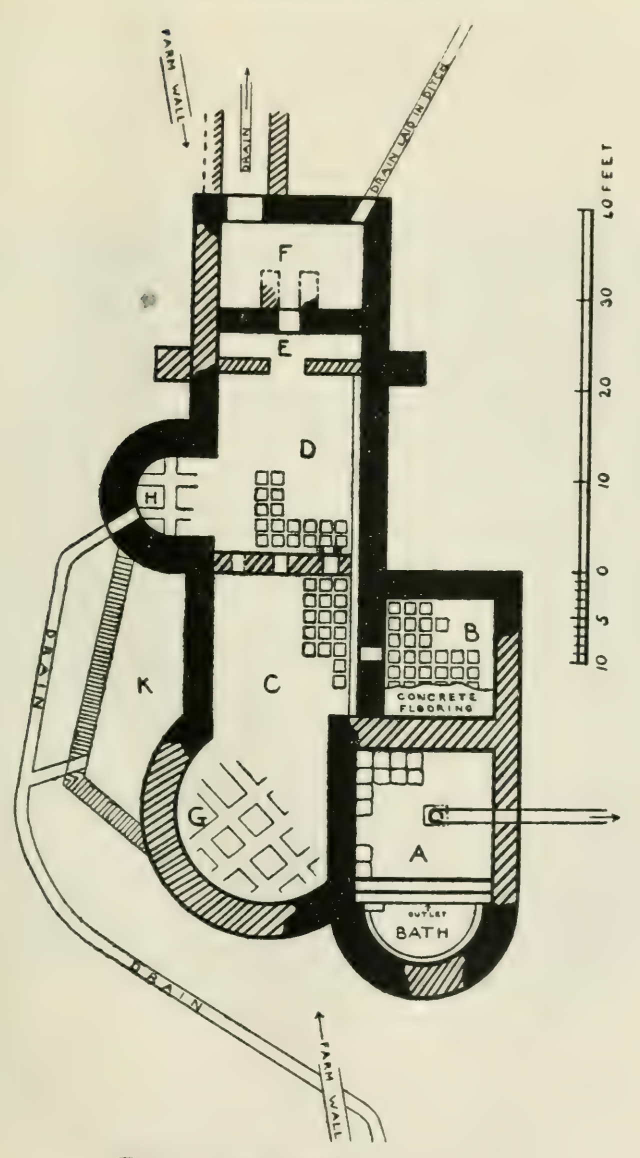


FIG. 10.—THE ANNEXE BATHHOUSE.

diameter, which may have held a wash-basin. It communicated directly with an underground drain which passed through the outer wall into the Annexe Ditch. This seemed to imply that the Annexe Ditch had already been dug, or at least designed, when the drain was laid, and the drain was manifestly an original part of the Bathhouse structure. A small apse contained a cold-water bath, rather less than 2 ft. deep, divided off by a low wall, inside which ran a shelf with a projecting seat (Pl. XXI, *C*). The sides of the bath showed a 6 in. offset about 1½ ft. from the bottom. Sides and bottom were lined with a fine brick concrete with a quarter-round skirting at their junction. Immediately inside the dividing wall was the outlet for the water, which had been run off into the drain under the floor of *A*. In this apse two fragments were found of a sculptured female figure—a Fortune or, perhaps, a Nymph (see p. 60, No. 6).

Opening off *A* was a hypocaust (*B* : *Tepidarium*) with part of its concrete floor still *in situ* (Pl. XXII). This room communicated by a flue with another hypocaust (*C*), such as is commonly found between the *Tepidarium* and *Caldarium*. This hypocaust, communicated by three flues with the *Caldarium* (*D*) adjoining the furnace. In these hypocausts lay some fragments of scored flue-tiles of both box and flange varieties. Rows of pillars composed of tiles had supported concrete floors 7-8 in. thick, with rounded skirtings at their junction with the walls. In rooms *C* and *D* (Pl. XXIII, *A*) the walls showed an 8 in. offset, or scarcement, about 1 ft. above the projecting footing. Upon this scarcement periodic sets of 7-8 in. tiles appeared to have been laid to carry the edges of the floors, the scarcement itself being considerably below the floor-level indicated by two of the surviving pillars (Pl. XXIII, *B*). One of these pillars, which seemed to stand at about its original height, was composed of eighteen tiles, averaging 2 in. thick and so giving a total height of 3 ft. The bottom tiles were 16-17 in. square ; then came one tile 10-11 in. square, and above that a series of tiles 7-8 in. square, which may have been capped originally with a single larger one. Since the 16-17 in. bottom tiles were laid 4-5 in. apart, the series of 7-8 in. tiles above gave quite 1 ft. of clear space between the stems of the pillars, while the distances between the pillars from centre



Tepidarium of Annexe Bathhouse.

A. Hypocausts in Annexe Bathhouse. Looking North.

B. Hypocausts in Annexe Bathhouse. Looking South.

to centre was 21·22 in.[1] A number of spanning tiles of that size (22 in. square) were found, on which the concrete flooring had been laid. Here and there, however, spanning tiles were replaced by stone flags. Again, some of the pillars did not show the proper sequence of tiles, nor was the placing of the pillars always quite regular ; thus, an additional pillar had been wedged in on either side of one of the flues through which *D* communicated with *C*. It need hardly be said that this sort of thing does not amount to anything like evidence of reconstruction. Indeed the fact that such slight irregularities at once attracted attention in this building is a testimony to the complete absence of all real evidence of reconstruction. In that respect it contrasted, not only with the Fort Bathhouse, but with the Headquarters Building and the Commandant's House.

A large apse (*G*) adjoined *C*, while a small apse (*H*) had been heated from *D*. In each of these apses the heat was distributed through a system of flues [2] covered with stone flags, upon which a concrete floor had been laid. Neither showed any trace of a wall dividing it from the adjoining room ; they may have been curtained off. A drain issuing from the smaller apse passed round the large apse, over the filled-up Fort ditches, into the Annexe ditch. Into this drain a short branch drain entered from a peculiar enclosure (*K*) fitted in between the two apses (Pl. XXIV, *A*). It contained some confused stonework and showed traces of burning. It was not an integral part of the main structure; its walls, though founded as low as those of the apses, were not bonded into them. Indeed one can hardly suppose it to have been carried above floor-level—it would have so marred the symmetry of the plan. Probably it was simply a retaining wall built round an excavated area in which there had been a stokeroom and furnace for heating the apse direct. This would provide a *Sudatorium* next the *Frigidarium*—a common arrangement.

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[1] As at Köngen (*O.R.L.* 'Köngen,' p. 16) and elsewhere. Our tiles, in fact, were regulation sizes. Cf. Vitruvius, *Archit.* v. 10 : *Suspensurae caldariorum ita sunt faciendae ut primum sesquipedalibus tegulis solum sternatur . . . supraque laterculis bessalibus pilae struantur ita dispositae uti bipedales tegulae possint supra esse conlocatae . . . quae sustineant pavimentum.*

[2] The same difference in the treatment of an apse and the *caldarium* it adjoins is found in a bathhouse at Corbridge (*Arch. Ael.* 3rd ser. vi. p. 234, Fig. 8).

The main furnace, as has been said, was situated beyond hypocaust *D*, where the outer walls had been strengthened by two large buttresses, presumably to enable them to withstand the lateral pressure of an arch. At the end of *D* was a stone-bottomed recess (*E*). Cisterns suspended across it would be in direct contact with the furnace, the projecting cheeks of which were indicated by ragged tongues of masonry in the stokeroom, *F* (Pl. XXIV, *B*). Here there was a mass of burnt stuff, among which lay some fragments of cooking-ware caked with soot. Since the stokeroom, like the hypocausts, was sunk below surface level, without having, like them, a raised floor, its entrance, which was in the back wall and was 4 ft. wide, was flanked outside by retaining walls. The stonework lying hereabout suggested that roughly formed steps had once led down to the entrance. This stonework overlay a covered drain which issued here and passed through the East Wall of the Fort to join the drainage system of the Retentura. Another drain from the stokeroom was laid in the bottom of the southern section of the inner east ditch of the Fort. Under a covering of large flags it passed across the Military Way into the northern section of the same ditch.

Both the inner and outer ditches of the Fort continued southwards under the Bathhouse. Where they passed through the site marked out for the building, and for some yards north and south of it, both ditches had been filled up with clay, the drain referred to being first laid in the inner ditch. This means that the Annexe Bathhouse was not built until some time after the Fort defences had been laid out. We have seen that the bathhouse within the Fort, after being a second time damaged or destroyed, was done away with. Was it only when the Fort Bathhouse was demolished, and to take its place, that the Annexe Bathhouse was built? It seems quite certain that this was not so, and that the bathhouse outside the Fort had been built long before any catastrophe had befallen the other. No disaster can have been anticipated, much less experienced, at a time when a considerable length of the east ditches was filled up, and a building erected over them which would give cover to an attack. And those who erected this bathhouse contemplated a permanent as well as a secure occupation; it was by far the most elaborate and care-



A. Apses of Annexe Bathhouse with walled-in space between.

B. Furnace of Annexe Bathhouse.

fully finished structure on the site. It may be added—for what it is worth—that under the clay filling of the ditches almost no pottery was found, whereas north of the filling potsherds were comparatively abundant along the whole length of the outer ditch. That would go to confirm the view, if it required confirmation, that the clay filling was put in, and the Bathhouse built, not long after the beginning of the occupation.[1] That there was a certain interval seems, indeed, fairly certain. If the drain issuing from room *A* implies, as has been suggested, that the Annexe ditch was already dug or designed, one would naturally suppose that by the time the Bathhouse was built a more or less permanent population had had time to settle down alongside the Fort. In fact the orientation of the Bathhouse would seem to have been determined, as we have said, by the alignment of existing structures at right angles to the Military Way. It even looks as if the enclosure must have been crowded with such dwellings; otherwise the Bathhouse would hardly have been wedged in against the Fort rampart, when the selection of a site a few yards further east would have saved the trouble (to say nothing of the danger) of filling up the ditches. Anyhow, it is significant that the ditches should have been filled up at all. They were not dug for nothing. Between the digging of the east ditches and the building of a bathhouse over them the attitude of the Roman troops to their surroundings had had time to undergo some change. And it may be added that, whereas the hypocaust pillars and spanning flags of the Fort Bathhouse had been laboriously wrought of the local sandstone employed for the walls of the building itself and of the other buildings of the Fort, those of the Annexe Bathhouse were composed of regulation tiles, as if there had been time, before this Bathhouse was built, to lay in a stock of such material.[2] But while everything points to a certain

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[1] The only significant piece of pottery that came from under the clay filling was the base of a cup of form Drag. 33, with a fragmentary stamp which may have been that of Borillus. This potter seems to have been already at work by the time our Limes was constructed (see p. 70, No. 6).

[2] Representing, possibly, the firstfruits of kilns on our own Limes, such as that discovered a few years ago at Mumrills. See Macdonald, 'Recent Discoveries on the Line of the Antonine Wall' in *Proc. Soc. Ant. Scot.* xlix. pp. 123-8.

interval having passed before the Annexe Bathhouse was built, it can fairly safely be assumed that the interval was a comparatively short one—perhaps no longer than the time that would elapse between the laying out of the Fort defences and the completion of the interior buildings. A bathhouse outside the ramparts was part of the normal scheme of a Roman frontier station, and while the masonry of the Annexe Bathhouse was smaller, neater and more carefully finished than the stonework of the Fort buildings,[1] it was essentially of the same character and had probably been the work of the same squad. We have seen that the North Gateway was erected by men of the Second Legion. No doubt the Annexe Bathhouse also was legionary work. Certainly it was the work of practised hands.

If the Bathhouse was built early in the occupation, it seems remarkable, when one considers the evidence of the interior buildings of the Fort, that there should have been no sign here of reconstruction. Still more remarkable was the absence of structural debris and of fragments of small objects. The remains were considerable, but they were all below ground-level and, though incomplete, they were still *in situ*, two pillars, seventeen and eighteen tiles high, still standing, precariously poised, when the site was excavated. Except for some fragments of tiles from wall-flues, there was almost no debris from the superstructure—little or no fallen masonry, no roofing tiles, not a nail, not a single scrap of window glass. The only objects discovered were the two sculptured fragments (one figure) in the apse off room *A*, a single unguent pot, with a fragment or two of beaker, and (in the stokeroom) some pieces of coarse ware caked with soot. The contrast with the Fort Bathhouse was most striking. Medieval or modern searchers for building material or for small objects could not have made so clean a sweep. And then there was the surfacing of clay. This was not only found all round the building but was noted here and there overlying the actual remains. In this we must recognise the same precaution, carried out on a larger scale, as was seen in the hypocaust of the Commandant's House,

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[1] This is usual; see, for example, *Castlecary*, p. 314, and Jacobi, p. 218. It need not be said that the masonry of the Annexe Bathhouse was utterly unlike the secondary work in the Fort buildings.

in the bath of the Fort Bathhouse and in the flue in room *D* of the same building—the laying down of a sealing of clay to prevent disused substructures from becoming waterlogged. The site must have been covered over with this spread of clay by the Roman troops. But the Roman troops could not, and would not, have cleared this area so scrupulously as to leave no pieces of window glass or the like lying about, if a disaster had previously occurred to litter the site—as disaster must have done and did do elsewhere—with a multiplicity of small debris. Yet the catastrophes in which so much of the interior of the Fort was wrecked would not have spared this outlying building, if it had been still standing at the time. One is forced to the conclusion that the Bathhouse—excellent cover for an enemy—had been carefully dismantled to floor-level, and the site overspread with clay, before ever the first disaster occurred—as soon as word reached the garrison of approaching danger. It would be the story of Castra Vetera over again upon a smaller scale: *subversa longae pacis opera, haud procul castris in modum municipii extructa, ne hostibus usui forent.*[1]

The Annexe. As at Castlecary, an Annexe lay to the east of the Fort, under the protection of the Antonine Vallum. Here the ground slopes eastwards to a broad depression, which appears to indicate the former course of a stream which has silted up and finally been artificially filled. It was once deep; a cut across it was sunk to a depth of 10 ft. without reaching bottom. From this channel, at a point about 70 yds. south of the Vallum, a ditch 13-14 ft. broad had been drawn to the south-east corner of the Fort, without being actually run into the Fort ditches. We have suggested that existing structures outside the Fort may have determined the alignment of the Bathhouse, and that the Annexe ditch was probably laid out at the same time as the Bathhouse was built, if not earlier. The Bathhouse, we have seen, can hardly have been built long after the occupation began. No doubt non-combatants had squatted alongside the Fort from the first, and presently a ditch would be drawn marking off their enclosure.

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[1] Tacitus, *Histories*, iv. 22.

The interior area of the Annexe, measured from the outer east ditch of the Fort, was about 1¾ acres. The enclosure was small, but probably every foot of the available space was made use of. That that is what the building of the Bathhouse over the Fort ditches may imply we have already suggested. It may be added that, trench for trench, the Annexe yielded more potsherds than the interior of the Fort. The part of it not occupied by farm buildings was trenched pretty thoroughly. Everywhere the soil was found to be much disturbed, but there were no remains of substantial structures. Here and there, however, post-holes were detected, though they gave no coherent plan, and iron nails were fairly common. The population had been housed in a collection of wooden huts.

A little to the north of the Military Way, about halfway across the enclosure, a trench laid bare a sculptured figure—a part of a Victory. The surrounding area was thereupon cleared, and two more sculptured stones were unearthed, along with a fragment of an altar. One was a second part of the Victory. The other was a figure of Mars—the god to whom the altar had been dedicated (see pp. 60-61, Nos. 7-10). Alongside these stones lay the only roofing tile discovered in the Annexe. Its presence here was perhaps accidental, but it is just possible that the stones may have been placed in a shrine which, though of wood, was distinguished from the other structures hereabout by being covered with a tiled roof. One could hardly associate with such a structure two stones mortised to receive wooden uprights which were found between this spot and the Annexe Bathhouse. If they had not been removed here from the interior of the Fort, they probably belonged to a verandah attached to the Bathhouse (see above, p. 48).

INSCRIBED AND SCULPTURED STONES

In the second edition (1852) of his *Caledonia Romana* (p. 320) Stuart records, on the authority of Dr. John Buchanan, that "at the beginning of the present [nineteenth] century, a small hamlet of a dozen cottages


1
2

Inscribed Fragments of Slab from North Gateway.

existed within the ramparts of Bemulie Fort, entirely built from the Roman ruins. Finely sculptured stones, one in particular with a human figure in high relief and wreaths of flowers, were visible in the walls of the cottages." He adds that they "are now all lost." Various inscribed slabs have also from time to time been assigned to Balmuildy, but it would appear that only one of these actually came from this site. It is the stone seen in 1698 "at a village called Balmudy, in the sole of a byyer window," and later acclaimed by Gordon in the *Itinerarium* (1726) as "the most invaluable Jewel of Antiquity that ever was found in the Island of Britain, since the Time of the Romans." [1] There was some reason for Gordon's enthusiasm, for the fragment, which mentioned along with the Second Legion the governor Lollius Urbicus, confirmed and localised the statement in the *Life* of Pius (c. 5) that the Emperor "through his legate Lollius Urbicus subdued the Britons, drove the barbarians back, and built in turf another wall." The excavations of the Glasgow Society have now added a companion stone to the "invaluable Jewel" (Pl. XXV, No. 2).

Ten fragments were found inscribed or sculptured.[2] Like the masonry of the Fort buildings, they are all of a sandstone common in the neighbourhood, and had no doubt been worked upon the spot. They fall into three groups. One group of four came from the North Gateway, two stones came from the bathhouses (one from each), and a group of four from the Annexe.

The inscribed fragments Nos. 1 and 2 (Pl. XXV) [3] were found lying together in front of the North Gate. No. 1 measures 16 in. by 14 in.;

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[1] *Itin. Sept.* p. 63; Macdonald, No. 20; cf. *ibid.* Nos. 11, 12, 14, 19.

[2] A stone scored with a device which was probably an indication of weight (Pl. LV, No. 2) is dealt with under "Miscellaneous Small Objects" (p. 98). Two fragments of moulded bases from the Annexe appeared to have belonged to altars; one of them may have been part of the base of the Mars altar, No. 9 (Pl. XXIX). Mention should also be made of a stone, 18 in. high, with two adjacent faces concave and finely dressed, the other two faces being straight and roughly tooled. The straight faces showed traces of a red ferruginous cement, as also did the bottom. This stone appeared to have been part of a pedestal. There is reason to believe that it came from the North Gateway, though this is not quite certain.

[3] Published by Haverfield, *Eph. Epig.* IX. iv. No. 1390.

No. 2 (in two pieces) measures 26 in. by 25 in. The stones are of the same thickness (10-11 in.), and have formed part of the same slab. The inscription, which has been enclosed by a rectangular moulding, is in lettering 4 in. tall. The letters on No. 1, as the moulding above them shows, have belonged to the first two lines of the inscription; they indicate the usual dedication to the Emperor: [IM]P(eratori) C(aesari) etc. No. 2 shows part of a pelta-shaped ornament flanking the inscribed tablet in a fashion common about the middle of the second century. The two bottom lines give the conclusion of the inscription: [SVB·Q·LO]LLIO [VRBICO·LEG·AVG·PR·]PR. The stone, therefore, has recorded the erection of the North Gate in the reign of Pius in the governorship of Lollius Urbicus. The numeral (II) in the line above probably indicates the Second Legion. In that case the inscription had run originally much as follows:

[IM]P·C[·T·AEL·HADR·ANTO]
[NIN]O[·AVG·PIO·P·P·LEG]II
[AVG·FEC·SVB·Q·LO]LLIO
[VRBICO·LEG·AVG·PR·]PR

That is, "In honour of the Emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, the legion II Augusta erected this under Quintus Lollius Urbicus, Legate of Augustus, Propraetor."

That the slab was erected by men of the Second Legion is in any case certain. It is proved by the sculptured fragment No. 3 (Pl. XXVI), which shows the forepart of a capricorn, the emblem of that legion. This stone, which measures 13½ in. by 14 in., is of the same thickness as Nos. 1 and 2, and was found along with them. There can be no doubt that it formed part of the same monument.

No. 4 (Pl. XXVI), which measures 18 in. by 15 in., must also have belonged to the same monument. It is of about the same thickness as Nos. 1-3, and, like them, was found lying in front of the North Gateway, though on the opposite (east) side of the street. It gives a rude representation of a standard-bearer. The inclusion of a standard and its bearer was perhaps to indicate that it was a vexillation that was here at work. Our figure corresponds very closely with that sculptured on the tombstone

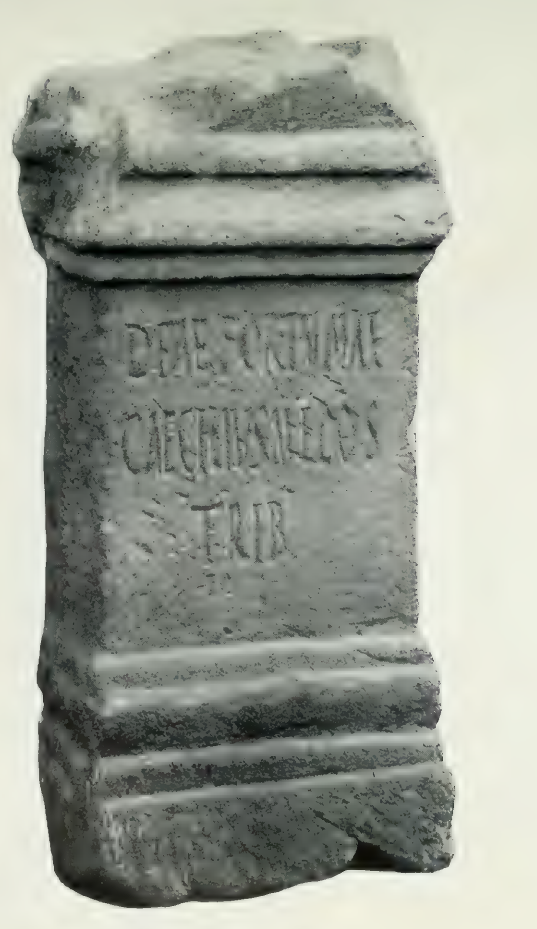


4 3

SCULPTURED FRAGMENTS OF SLAB FROM NORTH GATEWAY.

4 FIGURE OF STANDARD-BEARER. 3. FOREPART OF CAPRICORN.

5



6



5. Altar from Fort Bathhouse.

6. Sculptured Figure from Annexe Bathhouse.

of L. Duccius Rufinus at York.[1] Like ours, the York figure wears no helmet, and carries no arms. Neither *cingulum* nor *balteus* is visible. Both figures wear, over the tunic, the modified form of *paenula* not uncommonly seen on the military monuments of the Rhine and Danube.[2] The *codex ansatus* which the York figure holds in the free hand (left) is indicated also (right hand) on our stone.[3] The inscription on Rufinus' tombstone tells us that he was a *signifer* of the Ninth Legion. Our figure also would represent a legionary *signifer*. That admits of the supposition that the Second Legion was represented by a vexillation, for the standard of such a detachment would be in the charge of one of the *signiferi* of the legion. In that case our standard should be a *vexillum*, as in the Bridgeness monument, erected by this same legion.[4] Unfortunately, the top is broken off and the part remaining is not distinctive, though the length of plain shaft above the crosspiece would suit a *vexillum*.

The slab to which Nos. 1-4 belonged had no doubt been set up over the entrance. The inscription with its pelta-shaped ornaments must have measured quite 5½ ft. by 2 ft. 9 in. If we suppose, as seems natural, that the standard-bearer and capricorn flanked the inscription, the total length of the slab would be 9-10 ft.; that is, it would occupy the breadth of the archway (see p. 20).

Nos. 5 and 6 (Pl. XXVII) came from the bathhouses. The altar (No. 5) stands 2 ft. 4 in. high. It had been placed, as was usual, against a wall, the mouldings of capital and base not being continued round the back.

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[1] See Reinach, *Répert. de Reliefs*, ii. p. 543, No. 1. For a parallel from our own Limes, see the rudely executed figure from Shirva, illustrated Macdonald, Pl. XLVII, No. 4. From the same place came the slab, *ibid.* p. 314, No. 21, inscribed by a vexillation of the Second Legion.

[2] Lehner, *Skulpturen*, Pl. II, No. 3; Pl. III, No. 3; etc. Hofmann, Figs. 49, 53, 54.

[3] Representing the deceased's will, according to a suggestion of Hübner's cited Macdonald, p. 362. But our stone is not sepulchral. It is more probable that the *codex* symbolised such functions as were entrusted to *literati milites*, among whom *signiferi* were, of course, included; cf. Vegetius, *Epit. Rei Milit.* ii. 19-20.

[4] Macdonald, Pl. XLII. Cf. Dio, xl. 18, 2: ὁ γὰρ ἀετὸς ὠνομασμένος . . . οὐδαμόσε ἐκ τῶν χειμαδίων, πλὴν εἰ ποι σύμπας ὁ στρατὸς ἐξίοι, κινεῖται.

It was found lying across the foundation of the south wall of the Fort Bathhouse. As one would expect from its being found here, the altar is dedicated to Fortuna. The inscription is in "rustic" characters (2 in. tall), which, though not inelegant, contrast with the more official lettering of the Lollius slab. It runs :

DEAE FORTVNAE
CAECILIVS NEPOS
TRIB

That is, "To the goddess Fortune Caecilius Nepos, tribune (dedicated this)." [1] The rank of Caecilius Nepos, who was presumably the officer in command here at one time, is the only piece of evidence that relates to the garrison, apart from the size of the Fort and the barracks accommodation. As such, it is discussed below, pp. 106-9.

No. 6 (in two pieces giving together a height of 1 ft.) is a fragment of a draped female figure—a Fortune or, perhaps, a Nymph. It was found in the Annexe Bathhouse in the sunk bath-apse off the entrance room *A*. Here it had occupied a niche, or perhaps, like the statuette from the bathhouse at Duntocher,[2] it had provided an ornamental inlet for the water with which the bath was supplied. The Duntocher figure holds in front of her a large shell pierced with an orifice for water. To suppose something of the kind for our figure would be quite in keeping with what remains of the arms.

Nos. 7-10 were found together a little to the north of the Military Way about halfway across the Annexe. Nos. 7 and 8 (Pl. XXVIII), which measure respectively 13½ in. by 8 in. and 15 in. by 10½ in., are parts of the same figure—a Victory. The goddess holds a palm branch in her left hand ; the right hand has no doubt held up a wreath (No. 7). She is clad in a short *chiton*. Drapery seems to be crudely represented as falling obliquely over the left leg and as caught up above the right knee

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[1] Published by Haverfield, *Roman Britain in 1913*, p. 27, and by Cagnat, *Année Épigraphique*, 1914, No. 290.

[2] Macdonald, Pl. XLVIII, No. 1.

PLATE XXVIII.



Fragments of Figure of Victory from Annexe.



9



10

ALTAR AND SCULPTURED FIGURE FROM ANNEXE.

9. ALTAR TO MARS.

10. FIGURE OF MARS.

so as to leave the leg exposed (No. 8).[1] The right foot may have rested upon a globe, as is usual in this type of Victory, and perhaps we are expected to regard the right leg as correspondingly bent, though the stone is quite flat in profile. Victory may have been associated with Mars in the dedication of No. 9.

No. 9 (Pl. XXIX) is a fragment of an altar, 1 ft. 5 in. high. The inscription [2] is in letters 1¼ in. tall. Only the first line and part of the second remain:

D I O
[MA]RTI . . .

The dedication has been to Mars, with whom Victory may have been associated (see Nos. 7-8). *Dio* for *deo* is unusual. The rudely sculptured bust with helmet and cloak, which occupies the niche, must have been intended for the god. It is again Mars that is represented in No. 10 (Pl. XXIX). This is in three pieces, which together give a height of 2 ft. 3 in., but part of the legs is missing and the base is incomplete. On the base, above the fracture, there are traces of what appears to be lettering: CO . . . (?). The figure is the bearded Avenger, familiar on the monuments of the Empire. He wears helmet and cloak (*sagum*), tunic and jerkin, belt (*cingulum*) and sword, greaves and *caligae*. The tunic is reinforced with the usual petticoat in vertical strips. The clothing is of leather. The greaves, it will be noticed, have knee-caps ornamented with Medusa heads—a favourite apotropaic device on armour. Like many of the monuments from our Limes, Nos. 7-10, if set up when the troops first occupied the site, would indicate by their symbolism that the advance into Scotland in the reign of Pius had been provoked by aggression and served in part an immediate punitive purpose.

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[1] As Haug and Sixt, Nos. 227 and 260, and Bruce, *Roman Wall*, 2nd ed. p. 195.

[2] Published by Haverfield, *Roman Britain in 1914*, p. 29. There has been no fourth letter in the first line such as is there suggested.

COINS

Fourteen coins were found during excavation.[1] Their distribution is noteworthy. Except for one picked up in the Annexe and one in the West Granary, all were found in the Headquarters Building or in the neighbourhood of the Fort Bathhouse. From the latter site came no fewer than eight, though one of these had been dropped before the Bath-house was built (Appendix A, No. 7). The finding of coins in bathhouse buildings is a common experience. This makes it the more significant that in the large Annexe Bathhouse not one was discovered.

Four pieces were of silver, three of these being *denarii* of Vitellius, Trajan and Hadrian. The other may have been a legionary *denarius* of Mark Antony. The ten brass or copper pieces included one " first brass " and one " second brass " of Domitian, one " first brass " of Trajan, three " first brass " and one " second brass " of Hadrian, two " second brass " of Pius and one " second brass " of Marcus (Caesar). The series " does not contain a single specimen that might not have been dropped about the middle of the second century or later." See Appendix A.

POTTERY

The exploration of the site was searching enough to ensure that the collection of pottery should be thoroughly representative of the ware employed there throughout the occupation. Indeed the potsherds, which ran into thousands, must be fairly representative of the ware in general use upon the Antonine Limes.

The pottery gives no indication of a Flavian occupation. It is equally silent as to any post-Antonine (pre-medieval) habitation of the site, Roman or native. It belongs exclusively to the Antonine period. With the limits now assigned to the second-century occupation of our frontier it agrees

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[1] Stuart records that a " second brass " of Pius " in fair preservation " was found in 1848. See *Caled. Rom.* 2nd ed. p. 320, with Dr. George Macdonald's note in *Proc. Soc. Ant. Scot.* lii. p. 225.



VESSELS OF SAMIAN WARE.

absolutely. These limits, however, are already established upon other evidence. Though the pottery of our Antonine forts may help us to adjust certain incidents that fall within the second-century occupation, we do not require it to fix for us the limits of that occupation. On the contrary, the known limits of the occupation define exactly the period of our pottery.

The stations along the Antonine Wall were constructed about 142 and abandoned shortly before 185. No other sites in the Western Empire, outside of Scotland, show an occupation precisely coincident with those dates. This gives a definite, if confined, interest to our collection. By the second century the plainer fabrics were being made within the province, and so cannot be judged entirely by continental analogies; while the Samian ware imported into Britain from the close of the first century onwards, being predominantly Lezoux, ceases to be exactly paralleled in the dated deposits of the Rhine-Danube area, as that area becomes increasingly monopolised by the products of the East Gaulish and Rhenish potteries. For the second and following centuries, therefore, evidence is required from dated sites within our own province, and few Roman sites south of Cheviot have their history enclosed within limits so narrow and so exactly fixed as have the Antonine sites of Scotland.

Samian Ware

Many hundreds of fragments of Samian ware were found. They were mostly small and ill-preserved. Only half a dozen vessels could be restored (Pl. XXX), but it was, of course, possible to assign all except the minutest fragments to their types, while the decorated pieces had not suffered so badly but that the designs could in most cases be made out.

Undecorated Dishes (Pl. XXXI). A dozen or more different types of vessels were represented. Between two and three hundred pieces of platter were found. It was clear that almost all had belonged to form Dr. 31 and its variants. The comparatively shallow platter No. 1 (see also Pl. XXX, No. 1—much restored) is somewhat transitional in form, compared with the more bowl-like shapes 2 and 3. In No. 2 the side is rather more upright and the bottom (inside) flatter than in most of our

examples. A more representative profile is No. 3, which is quite distinct from the transitional platter, Dr. 18/31. Though characteristic for our site, shapes like our No. 3 are absent from Niederbieber except for a single survival (Oelmann, type 1 a). The shape in which Dr. 31 survives at Niederbieber to the end of the century is represented by our No. 4 (Oelmann, type 1 c). This open spreading variant approximates to Dr. 32, the angle between the long oblique side and the bottom almost disappearing. It is characteristic for the period of most active output at Rheinzabern (the thirty or forty years following 160). It does not seem to have become at all common before the reign of Marcus. The names given by Ludowici as occurring repeatedly on this shape (Lud. Sb) are equally common on Dr. 32 (Lud. Ta and Sc),[1] and are names of potters who were all at work in the reign of Marcus or later. A type which could be accepted as having come into use in northern Britain between 160 and 180 might, in certain circumstances, be of real assistance to us in working out the different phases of our Antonine occupation. On our site the shape was not at all a common one. In the few examples that were found, the bottom appeared to have been comparatively flat, and showed a circle of hatched pattern (rouletted) on the inside. The glaze, though flat, was fairly good, and the material was comparatively thin for dishes that must have had an internal diameter at the mouth of about 11 in. Fourteen fragments belonging to bottoms of form Dr. 31 showed traces of a stamp, but five of the stamps were entirely illegible. For the others, see Pl. XXXVII, Nos. 1-3, 5, 18, 22-25.

A number of fragments belonging to platters like Dr. 31 (or Lud. Tq) were composed of a greyish paste with a coating of dull red. No. 5 (see also Pl. XXX, No. 3) is of similar ware. It has the name of the owner, Primus, scratched upon it. The flat bottom shows a small incised ring, but no potter's name. The form was also represented in the genuine ware by one fragment. The platter with outward curved sides and upright rim is Dr. 51, but our examples rather resemble the modification Lud. Tv.

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[1] One may also note the occurrence of the two types together in a number of the graves uncovered at Pfünz (*O.R.L.* ' Pfünz,' Pl. VI, Nos. 4 and 8, and p. 66).

UNDECORATED DISHES OF SAMIAN WARE. Scale $\frac{1}{3}$.

Two other types of platter were represented, each by a single fragment; see Nos. 6 and 7. No. 6 shows a shape akin to the shallow dish which commonly has the rim decorated in barbotine. No. 7 is distinguished by a moulded lip and an offset at the junction of side and bottom, these two features making it a kindred form to our cup No. 11. It resembles Lud. Ti, and both it and No. 6 may have come from an Upper Rhenish pottery.

Our fragments of cup also exhibited four or five different shapes. Five examples were found of form Dr. 27, and two small fragments besides probably belonged to the same type. One of our examples, with the stamp of the potter Cucillus, was complete enough to restore—No. 8 (see also Pl. XXX, No. 4). The texture is firm and the glaze quite good, though rather flat. The other fragments had suffered much both in glaze and texture. They showed the flattened form (see No. 9) commonly seen in second-century examples of the type. Two of our pieces were of a greyish paste with a coating of dull red.

Two fragments were found of cups with outbent sides and upright rim. One of these, No. 10, indicates a somewhat large cup with an internal diameter at the mouth of about 4 in. The glaze is of rather an orange colour. The other fragment belonged to a much smaller cup with an internal diameter at the mouth of about 2½ in. This type of cup was produced at Rheinzabern as well as at Lezoux, and our No. 10 resembles Lud. Bh rather than Dr. 46. Another cup with strongly arched side was represented by a single fragment (No. 11), indicating an internal diameter at the mouth of over 4 in. It shows a moulded lip and an offset at the junction of side and bottom. It is a kindred form to the platter No. 7, and resembles Lud. Bc. Examples at Silchester and Wroxeter showed stamps in the form of rosettes, and probably came from a Rhenish manufactory. Ours also may be a product of that region. It is of good paste and glaze.

Almost all the Balmuildy cups had been of the form Dr. 33. Pieces of about eighty vessels of this shape were found (as against about half a dozen examples of form Dr. 27). They showed a great variety of size, though fragments of small cups were not numerous. Some pieces from the

ditches were of close texture and good glaze, but the majority were poorly preserved. Only two examples were found complete enough to restore—Nos. 12 and 13 (see also Pl. XXX, Nos. 5-6)—but, as it happens, they illustrate the two varieties of this cup which our fragments indicated. In No. 12, which bears the stamp of the potter Iuliccus, the sides curve strongly outwards. No. 13, which bears the stamp of Borillus, is straighter-sided and more upright. The earlier shape, that with the more outcurving sides, was not common on our site. Of twenty bases of form Dr. 33 all except two had been stamped with the potter's name. In nine cases the stamps were quite effaced. For the others, see Pl. XXXVII, Nos. 4, 6, 10, 14-17, 19-20.

Fragments were found of some five or six types of bowl. One piece, No. 14, which is of good glaze and texture, had belonged to a small handled vessel, which may have resembled a two-handled cup or bowl, similar to Dr. 34, found at Newstead in association with Antonine ware;[1] our fragment is too small to admit of a decision. Four pieces showed decoration in barbotine. One was part of an overhanging rim of the narrow-rimmed cup or bowl Dr. 35; two were parts of flatter rims belonging to the wider-rimmed form Dr. 36. The fourth piece, No. 15, shows barbotine decoration on a flange (at least 1 in. broad) about ½ in. below the top of the rim. This fragment represents a developed form of a type which appears in the first century. Examples similar to ours have been recorded at Gellygaer, York and Carlisle.[2] Fragments were also found of two bowls with a projecting moulding dividing the sides horizontally, as in Dr. 44; see Nos. 16 and 17. No. 16 indicates the same form as an example found at Newstead in a ditch of the Antonine occupation.[3] Such bowls were made at Rheinzabern as well as Lezoux, and our No. 16 suggests Lud. Sl. In No. 17 the moulding is more angular and is somewhat sharply undercut, while above it runs a well-marked groove.

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[1] Curle, Pl. XL, No. 17, and p. 199.

[2] *Gellygaer*, Pl. XII, No. 9; *York*, Pl. IX, No. 10; *Carlisle*, Pl. VIII, No. 100 f. Contrast the Flavian example illustrated, Curle, Pl. XXXIX, No. 11.

[3] Curle, Pl. XL, No. 20, and p. 200.

Decorated Bowls (Pls. XXXII-XXXVI). Between two and three hundred fragments belonged to decorated bowls. The pieces were mostly small and ill-preserved. Only one bowl was found at all complete. It is a somewhat coarse example of Dr. 30 and bears the stamp of the potter Cinnamus.

No. 1 *a*, *b* (see also Pl. XXX, No. 2). Fair glaze. Height $4\frac{3}{5}$ in., intern. diam. about the same. Below a plain margin of 1 in., ovolo moulding showing cabled cords without tassels. Successive panels (1 *b*, r. to l.) enclose (*a*) a common ornament of the cruciform kind, rings occupying the vacant spaces; (*b*) figure of Vulcan wearing *pilleus* and *exomis* like Déch. 39; (*c*) in upper half of panel a demi-medallion enclosing bird like Déch. 1038, in lower half the dolphin Déch. 1050; the vacant spaces again occupied by rings. The panels are repeated, but in a panel corresponding to (*a*) the ornament is replaced by the potter's stamp (retrograde) applied vertically, with a candelabrum-like object added to fill up the panel. All these decorative elements are characteristic of Cinnamus.

Four other fragments belonged to bottoms of bowls of the same cylindrical form. It is a shape that hardly outlasts the reign of Pius.

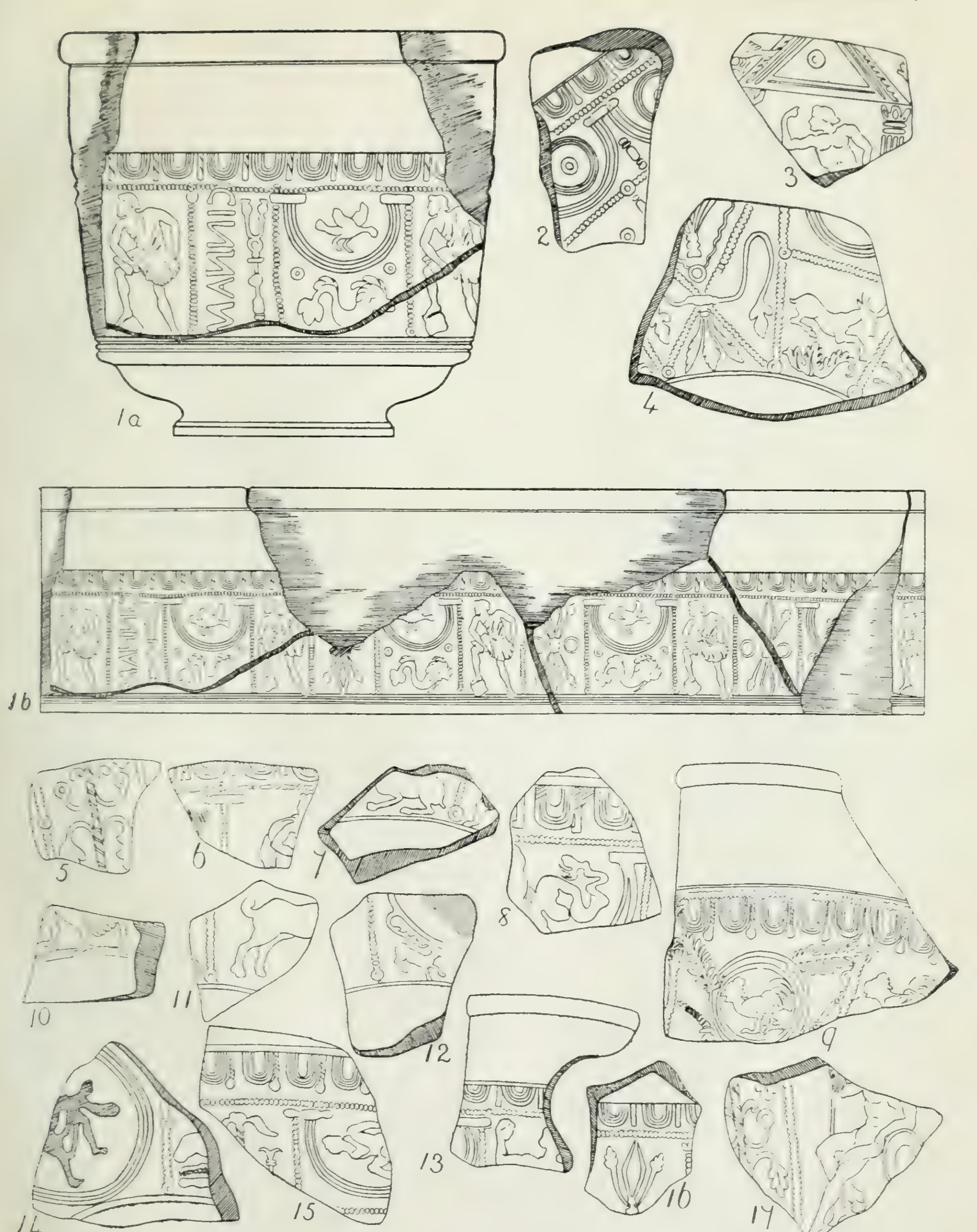
All the other decorated bowls had been of the form Dr. 37. Some fragments showed decoration in large foliated scrolls (Nos. 70-79) and some in "free style" (see Nos. 80-89), but in the great majority the decoration was in panels (sometimes divided horizontally) and medallions. These various styles were all employed by the potter Cinnamus, and very many of our pieces exhibit his ornaments. On form 37 his stamp occurred twice (see Nos. 70 and 71). The stamp of the potter Divixtus also occurred twice (see Nos. 20 and 25), and a few other fragments showed his characteristic style (see Nos. 19, 21-2, 23, 24). One piece (No. 56) bears the stamp illustrated, Pl. XXXVII, No. 26. One bowl (see Nos. 44-5—same bowl) has been marked with the circular stamp, Pl. XXXVII, No. 27, while in another (see No. 90) the potter's mark takes the form of a rosette.

Most of the decorative elements are familiar from Déchelette, and call for little remark. No. 4 (style of Cinnamus) illustrates the continued use of the large cruciform ornament in the Antonine period. Note the seated figure in No. 15 applied horizontally. In No. 83 the lioness (right) has been impressed on the mould with a broken stamp, and the space between the forepart of the animal and the *venator* has been filled up with the acanthus ornament, Déch. 1160. The filling ornament seen in No. 85 and twice

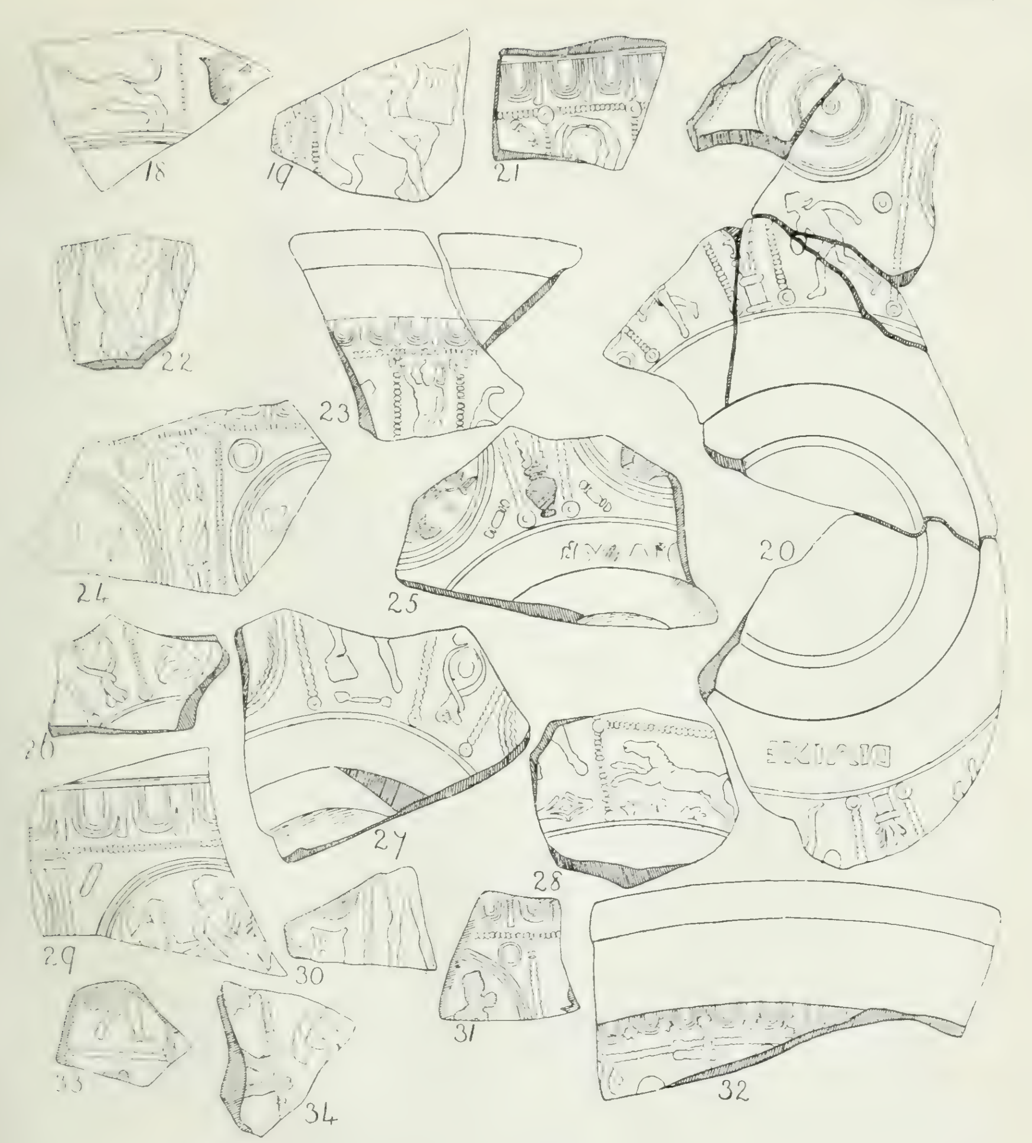
(rubbed) in No. 87 is the snake-and-rock, Déch. 960 *bis*, which Déchelette takes as a text for some remarks on the degradation of decorative motives (vol. i. pp. 226-7). For stamped bowls showing this ornament and in the style of our pieces, see *Wrox. III*, p. 40, No. 28, and p. 41, Fig. 2.

The decorative elements clearly indicate that the bulk of the ware has been of Lezoux origin. But the products of the East Gaulish and Upper Rhenish groups of potteries are also represented. Nos. 40, 43, 44-5, 51, 55 and 73 exhibit ornaments which were the common stock of the group of Rheinzabern potters, more or less closely associated, whose products show the influence of Ianuarius (or Ianus). Thus, the beaded network of No. 40 is in the style of Ianuarius. The small lion of No. 55 (=Ludowici, II, T8) is also a type used by Ianuarius, and copied by Cerialis and others. Again, the foliage attachments set against the vertical beadrow in No. 51 derive from a leaf-on-stalk used by Ianuarius (Fölzer, Pl. I, No. 44) and also copied by Cerialis and others. This foliage ornament appears at Wroxeter (*Wrox. III*, Pl. XXIV, No. 12) on a fragment which also shows the dancing satyr (a little reduced from Déch. 382) of our Nos. 44-5. The diminutive figure seen in those pieces alongside the dancing satyr appears to be derived, probably through Ianuarius, from a type used by the East Gaulish potter Satto (Fölzer, Pl. XXVI, No. 183), itself apparently reduced from Déch. 199. The diminutive figure and the dancing satyr of Nos. 44-5 appear again together at Newstead (Curle, p. 221, No. 6) with the leaf, placed free in the field, of our No. 73. Here again we have to do with an ornament of Ianuarius (*O.R.L.* 'Zugmantel,' Pl. XXIII, No. 5). It is to be noticed that both in our fragment and in the Newstead example a spiral stem has been applied to the leaf from a different die. Barthel (*ibid.* p. 114) notes that this is a practice of Ianuarius. The absence of a beadrow defining the upper margin of the decorated zone may also be noticed as a Rheinzabern feature. The leaf occurs again in No. 43, and here also a spiral stem has been separately attached. In the adjoining panel of No. 43 is a Silenus-like figure not in Déchelette.

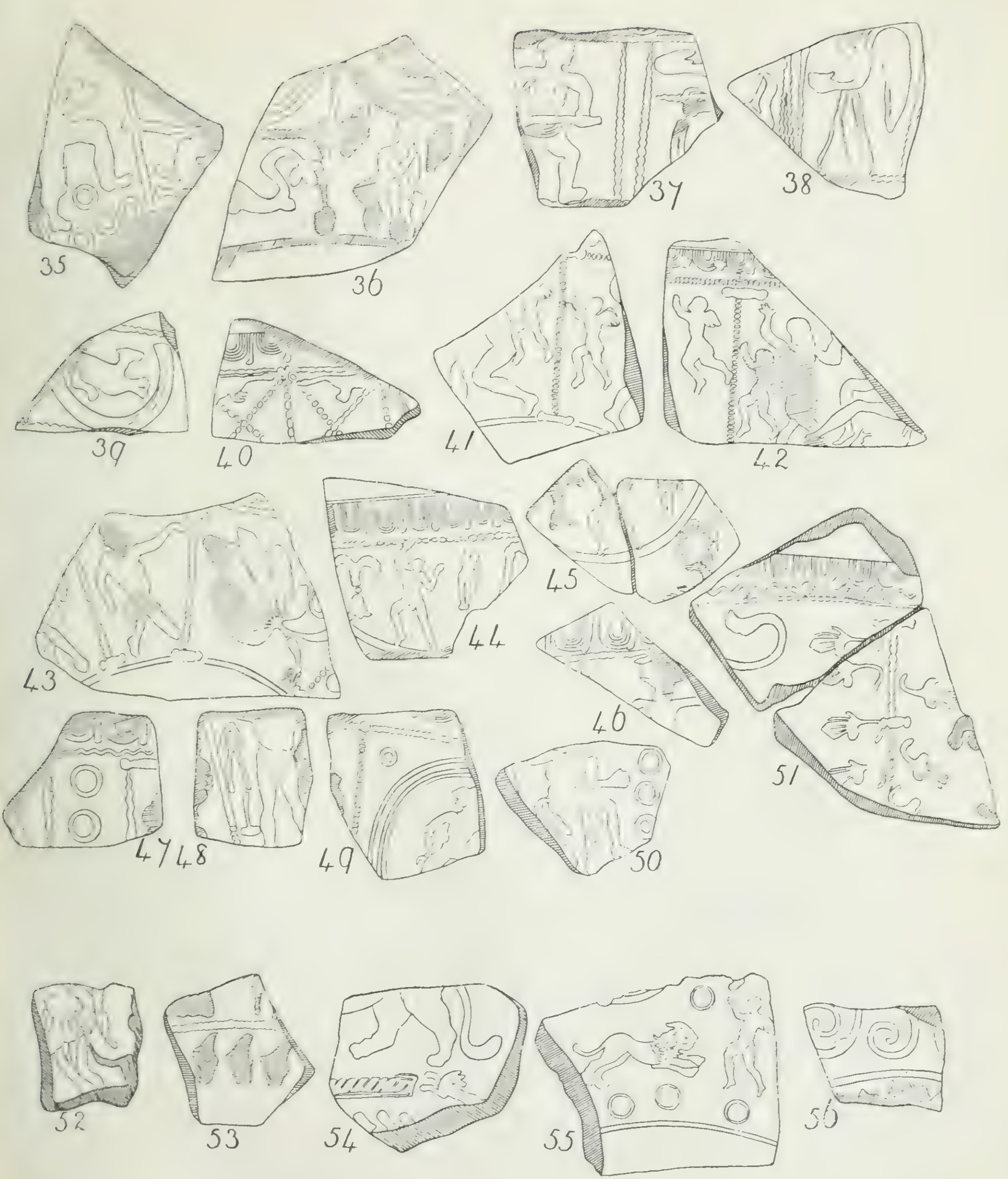
Of those fragments Nos. 51 and 55 are of a thick, hard ware, showing a crude bright-red glaze, rough on the decorated surface. No. 54 is of similar ware, and here again the decorative elements, which are coarsely



DECORATED SAMIAN WARE. SCALE: 1*b* $\frac{1}{3}$, OTHERS $\frac{1}{2}$.

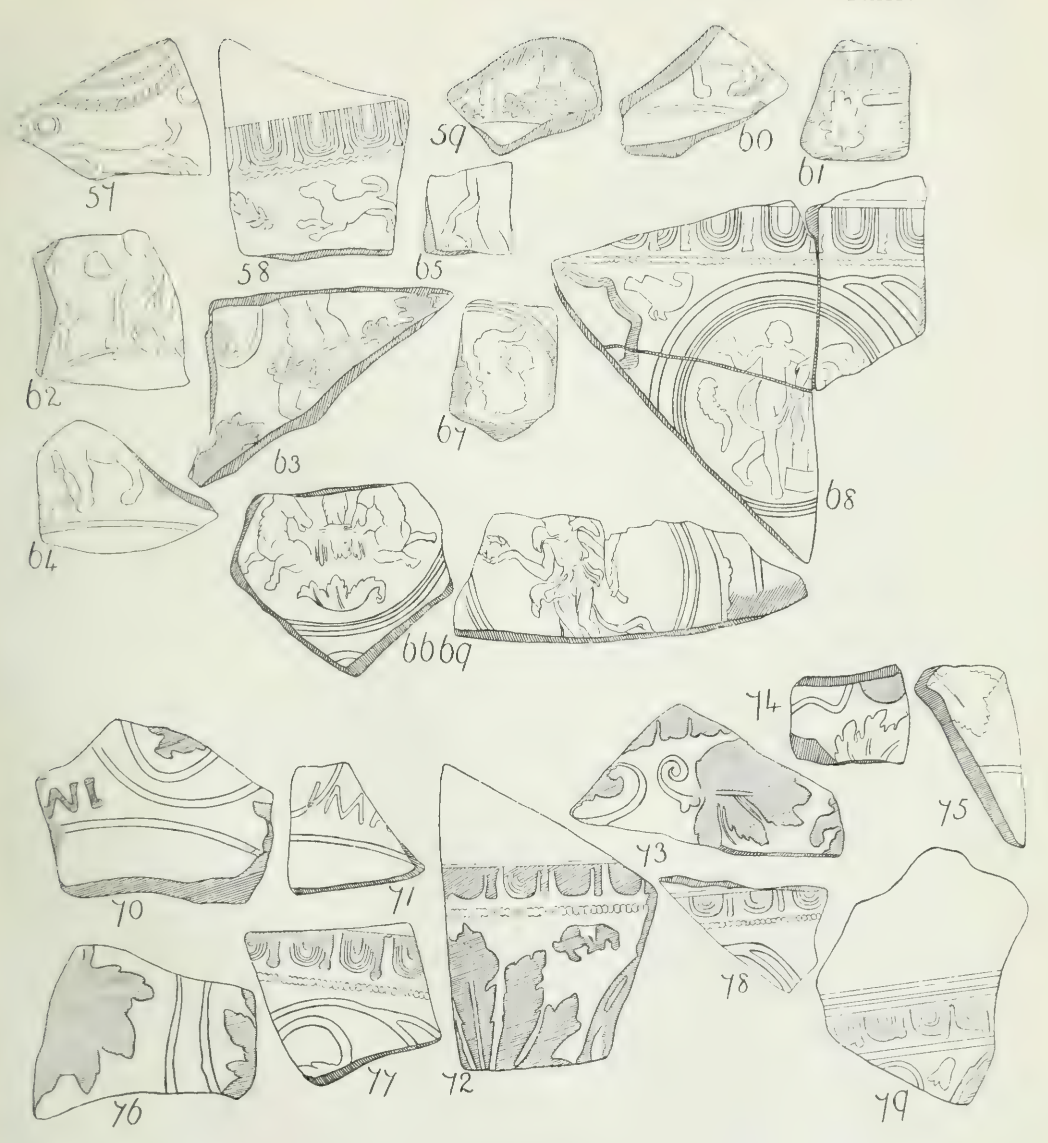


Decorated Samian Ware. Scale ½.

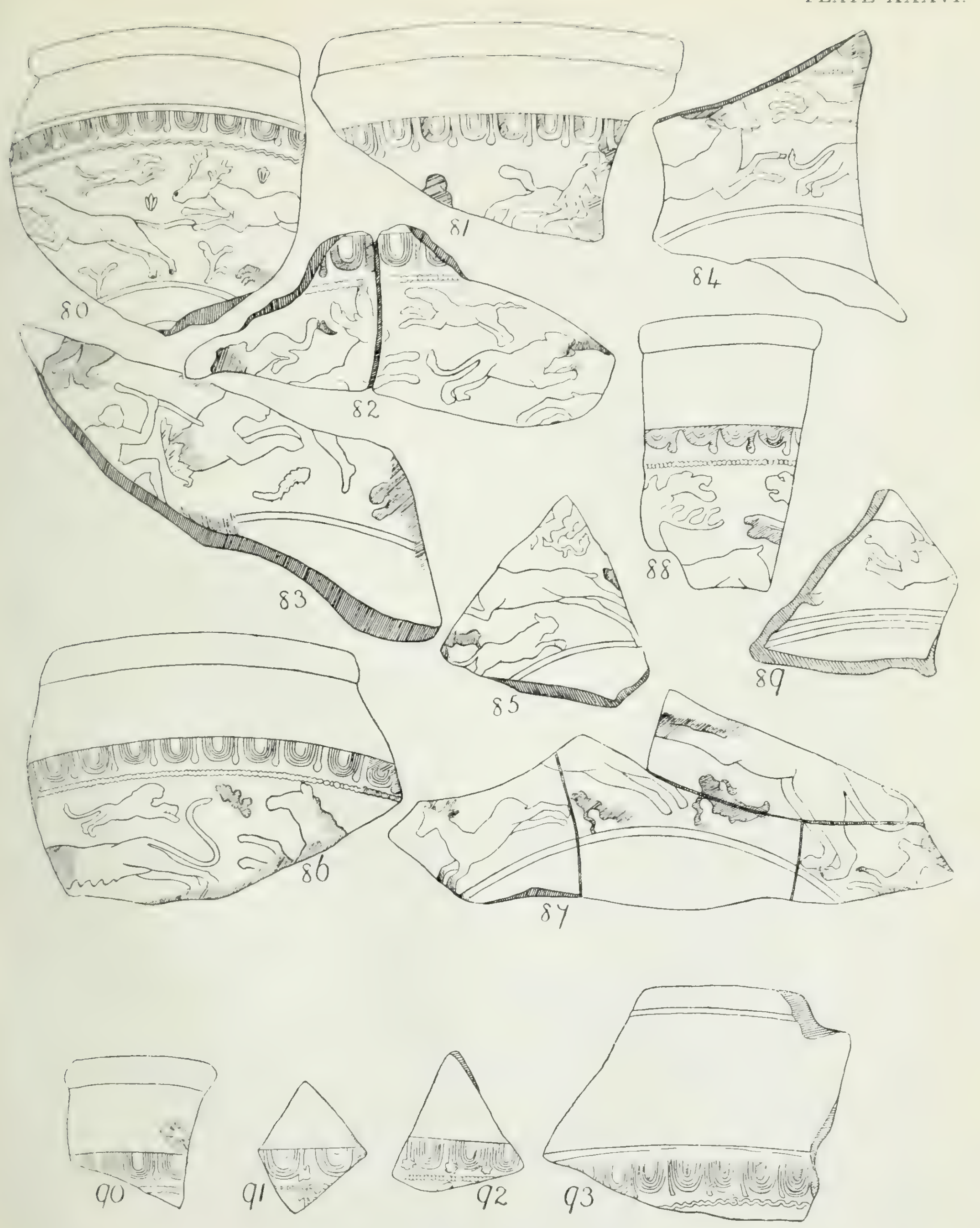


Decorated Samian Ware. Scale ½.

PLATE XXXV.



DECORATED SAMIAN WARE. SCALE $\frac{1}{2}$.



Decorated Samian Ware. Scale ½.

moulded in high relief, would seem to indicate a Rheinzabern origin. Below a thick cabled band (Ludowici II, O 118, etc.) comes part of what must have been a band of chevron pattern. This motive, derived from South Gaulish and early Lezoux ware, does not occur on Lezoux ware of the Antonine period.

A row of crosses or rosettes forming the lower margin of the decorated zone, as in No. 59, is also a motive which is found in early Lezoux ware, but is absent from Lezoux ware of the Antonine period. On the other hand, it is common on Trèves ware and occurs on Rheinzabern ware. To one or other of those groups of potteries our fragment must be assigned. So also Nos. 53 and 62. The band of ornaments (defaced) running below the main decorated zone of No. 53 is a motive derived from South Gaulish ware, while the Victory of No. 62 is reduced from a La Graufesenque original (Déch. 481). Both those fragments show a rough glaze of a brown-red, almost chocolate, shade, such as distinguishes much of the Trèves ware (Fölzer, p. 54). The same glaze appears in Nos. 37-9 (one bowl) and No. 46; these pieces are of a hard thin ware with the decoration very coarsely moulded in high relief. It is to the Trèves group that we should probably assign No. 56, which shows a row of spirals as lower margin to the decorated zone, below which comes the potter's name (Pl. XXXVII, No. 26). The spiral motive is characteristic of the potters of La Madeleine, notably of Albillus, whose style strongly influenced the products of Trèves. A Trèves origin is also indicated for No. 9 both by the individual ornaments and by their disposition—the beaded cornucopias and palm-leaf ornaments filling up the corners, as Fölzer, Pl. VIII, No. 29, etc.

Potters' Stamps on Samian Ware (Pl. XXXVII). Besides two potters' marks in the form of ornaments (Nos. 27 and 28), twenty-six name-stamps were found in which some part at least of the lettering was legible. The two ornamental marks and five of the names (Nos. 8-9, 12-13 and 26) were on decorated bowls of form Dr. 37. One of these stamps (No. 26) is uncertain; the others are stamps of Divixtus (twice) and Cinnamus (twice). The stamp of Cinnamus also occurred on a bowl of form Dr. 30 (No. 7; cf. Pl. XXXII, 1 *a*, *b*). Of the twenty stamps on plain ware, nine were on form Dr. 31 and nine on form Dr. 33. One, that of Cucillus, was on form Dr. 27.

A piece of concave bottom showing the fragmentary stamp No. 21 may have belonged to a large coarse cup of the same form or perhaps to a bowl of form Dr. 38 (Lud. Sd).

1. AL[B]VCI On high-coned base of form 31. Stamp of the Lezoux potter Albucius.

2. BANVILLI M(*anu*). On form 31. Stamp of the Lezoux potter Banuillus.

3. BAN . . . On base of same form, showing graffito No. 5 (Fig. 11). Probably stamp of Banuillus, as No. 2.

The stamp of this potter is not very common in Gaul, and appears to be absent from the Rhine-Danube area. In Britain it has been recorded at Wroxeter and Corbridge. At Wroxeter it was found on form 27 associated with ware of the early second century (*Wrox. I*, p. 48). Not at Silchester or London.

4. BORILLI OF(*ficina*). On form 33 (Pl. XXXI, No. 13). Stamp of the Lezoux potter Borillus.

5. BO . . . I OF(*ficina*). On form 31. Probably same stamp as No. 4.

6. . . . LLI(?) OFFIC(*ina*). On form 33. Probably the potter is again Borillus, whose stamp frequently concludes in this way.

No. 6 was found under a filling of clay laid into the east ditches before the Annexe Bathhouse was built over them.

If, with Barthel (*O.R.L.* ' Zugmantel,' p. 133, and ' Cannstatt,' p. 52), we identify Borillus with the potter who stamps Borilus or Boril. f., we can include among the sites on which our potter's name has been found the Earth Fort at the Saalburg (Jacobi, p. 316), which would mean that he was already at work in the reign of Hadrian. Whether this identification holds good or not, it is probable that our potter was already active by the time our Limes was constructed. That is indicated by the occurrence of his stamp on the Upper Rhine and on the Danube (*e.g.* at Pfünz and Carnuntum), a market from which the fabrics of Lezoux had been virtually excluded by the middle of the century.

7. CINNAM . . . On form 30 (Pl. XXXII, 1 *a*, *b*) ; vertically (retrograde) on decorated band. Stamp of the Lezoux potter Cinnamus.

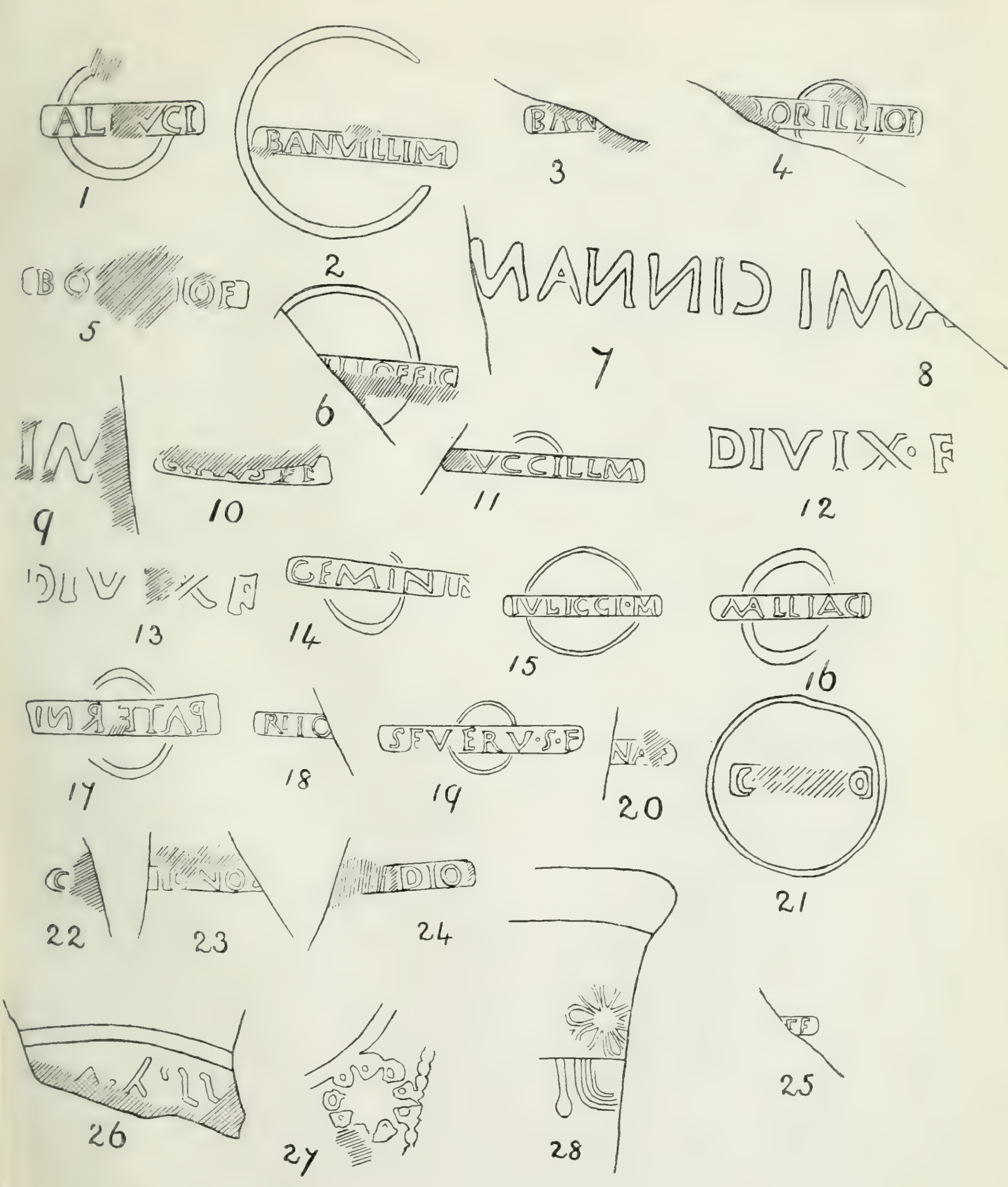
8. . . . AMI. On fragment of form 37 (Pl. XXXV, No. 71) ; horizontally (retrograde) near bottom of decorated band. Same potter.

9. . . . MI. On fragment of form 37 (Pl. XXXV, No. 70) ; horizontally (retrograde) and upside down near bottom of decorated band. Same potter.

10. On form 33. The name of the potter is separated from the F(ecit) by a small palm branch. Stamp of Clitus ?

11. [C]VCILL(*i*) M(*anu*). On form 27 (Pl. XXXI, No. 8). Stamp of Cucillus, a potter of Central Gaul.

12. DIVIX(*tus*)·F(*ecit*). On lower plain margin of form 37 (Pl. XXXIII, No. 20). Stamp of the Lezoux potter Divixtus.



Potters' Stamps on Samian Ware. Scale $\frac{1}{1}$.

13. DIV[I]X(*tus*) F(*ecit*). Upside down on lower plain margin of form 37 (Pl. XXXIII, No. 25). Same potter.

In Scotland the decorated bowls of this potter belong to the beginning of the Antonine occupation. This seems to represent the later period of his activity, and it is improbable that the Divixtus who worked at Rheinzabern in the second half of the century and supplied plain wares to the Outer Limes is the same potter. It is not an uncommon name.

14. GEMINI M(*anu*). On form 33. Stamp of the Lezoux potter Geminus.

Our stamp has been found at Newstead on form 33, and on that shape and on form 31 in Antonine deposits at Wroxeter. On the Continent the stamp appears on plain ware within the Rhine-Danube area, *e.g.* at Cannstatt, where it is to be dated before the middle of the century. On the other hand, the name has been noted on form 38 in the late second-century deposit at Corbridge (*Corbridge*, p. 175). This deposit includes a few fragments of form Dr. 45, and on that late form, no example of which has been met with in Scotland, the name of Geminus appears repeatedly in England. To identify our Geminus with the Cannstatt Geminus, on the one hand, and the maker of form 45 on the other, would be to allow a wide *floruit*. At Corbridge and elsewhere Geminus stamps on form 45 indicate the full Roman nomenclature—*M. F. Gemin*(*i*) *m.* (*Arch. Ael.* 3rd ser. xii. p. 280). This may represent our potter in an honourable old age.

15. IVLICCI·M(*anu*). On base of outcurved cup of form 33 (Pl. XXXI, No. 12). Stamp of the Lezoux potter, Iuliccus.

16. MALLIACI. On large cup of form 33. Stamp of the Gaulish potter, Malliacus.

It is more probable that this potter worked in Central Gaul than in North Gaul. His stamp occurs on the Rhaetian Limes at Gnotzheim as well as in Belgic Gaul.

17. PATERNI. Retrograde on large base of form 33. Stamp of the Lezoux potter, Paternus.

A Paternus seems to have worked at Rheinzabern, stamping as Ludowici I, p. 63 (*a*). This stamp, which appears commonly on Lud. Ta (Dr. 32), a favourite Rheinzabern form from the reign of Marcus onwards, occurs on the Outer Limes. But much of the plain ware bearing the name of Paternus must, from its distribution, be the product of a Lezoux potter working in the first half of the century. This must be the same Paternus as produced decorated ware; it is noteworthy that our form of the stamp (which is not common on the plain ware) occurs on some of the decorated bowls (= *C.I.L.* xiii. 10011, 241) in place of the more distinctive stamp which they usually bear (*ibid.* 98 and 242). Paternus' output of decorated bowls, to judge by their exclusion from the Rhine-Danube area, must have begun at a rather later date than his production of plain ware, and the history of his output would appear to be somewhat analogous to that of Cinnamus. Our stamp, from its form and its occurrence on both the plain and decorated ware, should belong to a middle point of his career.

18. R'IO . . . On form 31. Probably the stamp of Ritogenus, a potter of Central Gaul.

19. SEVERV·S·F(*ecit*). On base of large coarse cup of form 33 with somewhat orange glaze.

A Severus seems to have worked at Rheinzabern, and the stamp has also been found at Westerndorff. It occurs on Lud. Ta (Dr. 32), which was not in vogue before the reign of Marcus. In a Rheinzabern grave a fragment stamped with the name was found associated with a coin of Elagabalus (Ludowici III, p. 180). At Newstead (Curle, p. 234) it was found in a refuse-pit along with the stamp of Cracuna, for whom see No. 20. In Scotland it probably belongs to the reign of Marcus.

20. . . . NA F(*ecit*). On small upright cup of form 33. Perhaps the stamp of Cracuna, which occurs at Castlecary.

From the distribution of this potter's stamp on the Continent, it has been conjectured that he worked in the Moselle region (*O.R.L.* 'Zugmantel,' p. 136 ; Oelmann, p. 13). At Newstead the stamp was found in a refuse-pit along with the stamp of Severus (see No. 19). A Corbridge deposit in which it occurred contained examples of late forms like Dr. 45, etc. (see above, No. 14). The stamp is included in the Pudding Pan Rock collection, most of which dates to the later part of the second century. Again, it has been found at Niederbieber on a type of platter (Lud. Sb) which is not a mere survival on that site. Elsewhere it has been noted on form 32 (*O.R.L.* 'Zugmantel,' p. 136). In Scotland it probably belongs to the reign of Marcus.

21. C . . . O. On concave base belonging to large cup of form 27 or perhaps to a bowl of form 38 (Lud. Sd).

22. C . . . On form 31.

23. . . . IL?NO . . . On form 31.

24. . . . N?DI O(*fficina*). On base of large coarse platter of form 31, with flat, rather orange glaze. Stamp of C(K)alendius ?

25. . . . F(*ecit*) or . . . FE(*cit*). On small fragment of base of form 31.

26. On lower plain margin of form 37 (Pl. XXXIV, No. 56). The name is incomplete, and the surviving letters might be variously read. Our potter is probably East Gaulish. Rows of spirals are characteristic of Albillus, for whose stamp see the Wiesbaden bowl illustrated, *O.R.L.* 'Inheiden,' p. 8.

27. On fragment of form 37 (Pl. XXXIV, No. 45). For similar stamps on Rheinzabern ware see Ludowici III, p. 82, M 30 ; Oelmann, Pl. IX, Nos. 97-99 ; etc.

28. Eight-petalled rosette above ovolo on fragment of form 37 showing crude red glaze (Pl. XXXVI, No. 90). Such stamps appear to be specially characteristic of Rheinzabern (Ludowici I, p. 87, M 5).

Of the names eleven are certain : Albucius, Banuillus, Borillus, Cinnamus, Cucillus, Divixtus, Geminus, Iuliccus, Malliacus, Paternus and Severus.

Ritogenus is probable, and if Cracuna is doubtful, the name occurs at Castlecary and may be considered here along with the others.

Of those thirteen potters only Cinnamus and Cracuna are represented by stamps elsewhere on the Antonine Wall, though unmistakable examples occur of the decorated ware of Divixtus. But all the names have been found at Newstead or Birrens, except Banuillus, Iuliccus and Malliacus; and all of them, without exception, have been found at Corbridge. There is nothing here to distinguish the Samian ware of our Limes from the contemporary ware of southern Scotland and the region of the English Wall. Again, all our names are found at Silchester and also at London, except Banuillus and Iuliccus, which occur on neither of those sites, but are both found (with almost all the others) at Wroxeter. Our Limes, then, seems to have drawn from the same sources of supply as the rest of the province.[1]

So far as the Samian ware is concerned, there is no evidence of any special connection with the Rhine. Cracuna may have worked in the Moselle region, and stamp No. 26 probably gives the name of an East Gaulish potter. Again, Nos. 27 and 28 are probably marks of Rheinzabern potters, and it is to Rheinzabern that our Severus appears to have belonged. But all the other stamps come from Central Gaul. Again, if certain of our plain ware fragments belonged to Rheinzabern types, these were exceptional, and though some (about one-fifth) of our decorated pieces suggest an East Gaulish or Upper Rhenish origin, the proportion is no greater than is to be found among the second-century ware at Silchester or Wroxeter. If, during the Antonine occupation, ships passed to and fro between the mouth of the Rhine and the Firth of Forth (as one would suppose), they were not freighted with Rhenish red-glaze ware.

But the Rheinzabern potteries do not seem to have attained their greatest output till the time of Marcus, and it is doubtful if much of the Samian ware left on our site had been imported into Britain so late as that reign. If a type so common at Rheinzabern in the reign of Marcus as Lud. Sb (=our platter No. 4) is rare with us, and if the distinctive

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[1] The other known stamps from the Wall (Macdonald, pp. 373-4) confirm this.

patterns which East Gaulish and Upper German potters were already employing on their decorated bowls before the end of that reign are entirely absent from our site, it is probably as much a matter of date as of provenance. In date as well as provenance ours is a homogeneous collection. Almost a majority of our decorated pieces might well be assigned to a single potter—the potter Cinnamus. The bulk of our decorated ware represents a period when the activity of Cinnamus, now at its height, overlapped with that of Divixtus. That period is round about mid-century. That the bulk of our ware belongs to the reign of Pius is also the conclusion suggested by the stamps. Cracuna and Severus may well belong to the reign of Marcus, and if our Geminus is the Geminus who made Samian mortaria, his activity also must have extended into that reign. But the rest of the potters are to be assigned to the first, rather than the second half of the occupation. That none of them occurs on the Outer Limes (for the Divixtus and Paternus who appear there are probably not our potters) does not, of course, prove that they had ceased to produce by the time the Outer Limes was constructed, but merely testifies to the exclusion of Lezoux ware from that frontier. But it must be remembered that from about mid-century onwards the Rhine-Danube area as a whole was monopolised by the East Gaulish and Upper Rhenish potters. Yet all our Lezoux potters, except Banuillus, are represented within that area. That would indicate that they were at work before mid-century, most of them probably before the end of Hadrian's reign. Nor would the absence of Banuillus be due to his being any later than the others, but to his limited output and distribution.

It follows that the negative evidence of the imported pottery of our Limes, significant enough as regards the superior limit of the occupation, must be used with caution as regards the inferior limit. The fact that our Samian ware, in the mass, represents the reign of Pius must be taken into account in estimating the date at which certain types first came into use in Northern Britain—the Samian forms Dr. 32 and 45, Samian ware with incised decoration in " cut-glass technique " or showing the extended application of the barbotine process, and Samian and black-glaze (Rhenish) ware with decoration in white slip. On the Continent most, if not all, of those forms and

modes of decoration were already coming into vogue in the reign of Marcus. Some of them at least may have made their way into Northern Britain before the end of that reign,[1] and it is quite possible that examples may yet be found to have reached Scotland before our Limes was abandoned.[2] Their absence from Balmuildy and Newstead may be due simply to the fact that little imported ware was being traded over Cheviot (or by sea) in the later part of the Antonine occupation. One would expect the whole

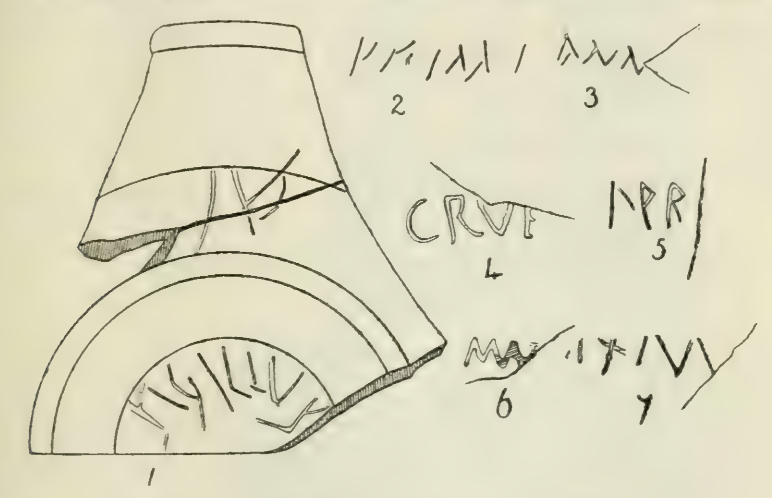


Fig. 11.—*Graffiti* on Samian Ware. Scale ½.

length of the occupation to be better represented by the coarser ware, which, being made nearer hand, would be more continuously replaced.

[1] The large Corbridge deposit, *Corbridge*, pp. 174 ff., contained among its Samian ware examples of form 45 and globular pots with incised decoration and decoration in barbotine. This deposit is mostly Antonine, but unfortunately its limits are somewhat uncertain.

[2] In *Proc. Soc. Ant.* 2nd ser. xxiii. p. 119, examples of incised Samian ware are described as occurring in Roman forts in Scotland. This may be a reference to two incised fragments mentioned *Castlecary*, p. 331, where, however, it is not made clear that the fragments were actually of Samian ware. It has not been possible to verify this owing to the collection in the National Museum at Edinburgh not being available for inspection.

For the same reason it was less jealously guarded. Marks of ownership—and such marks were not noted except on pottery—were confined to vessels of Samian ware.

Graffiti on Samian Ware (Fig. 11)

1. On outside of bottom of platter, Pl. XXXI, No. 3. Found in the Annexe. Besides a mark above the foot-ring, there is the owner's name, Sigillus or (more probably) Sigilius, scratched upon the base. A Sigilius, an *emeritus* (or a Sigilius Emeritus), appears on an inscription from Old Carlisle (*Eph. Epig.* IX. iv. 1128). Sigillius occurs as a cognomen on an altar and on a Military Diploma from the Danube region (*C.I.L.* iii. 1063, and suppl. iii. Dip. lviii.). See p. 106, n. 2.

2. On outside of platter, Pl. XXXI, No. 5. PRIMI—the mark of the owner, Primus.

3. On outside of base of form 31 with stamp of Albucius. The surviving letters are ANN . . . .

4. Incised with broad point on outside of base of form 31. CRVI or CRVF.

5. On outside of base of form 31 with stamp No. 3. FPR . . . or APR . . . .

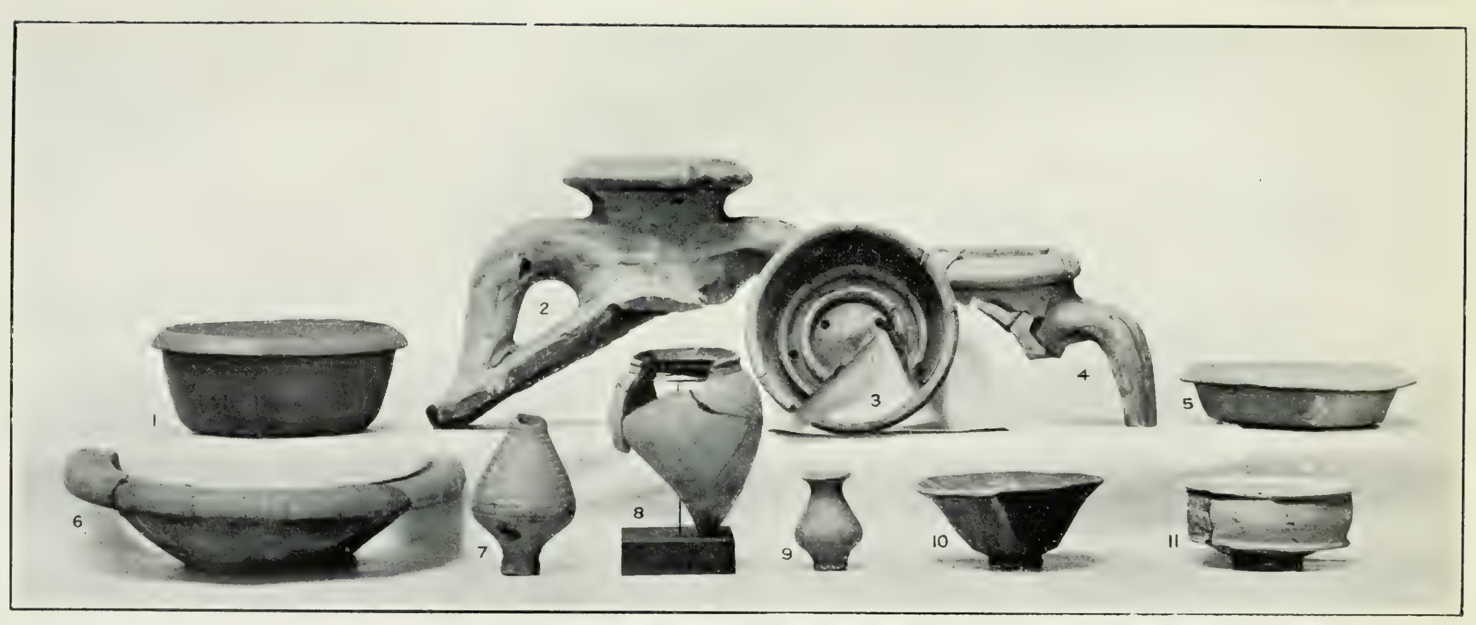
6. Incised with broad point on lower plain margin of form 37. MAT . . . .

7. On outside of bottom of form 31.

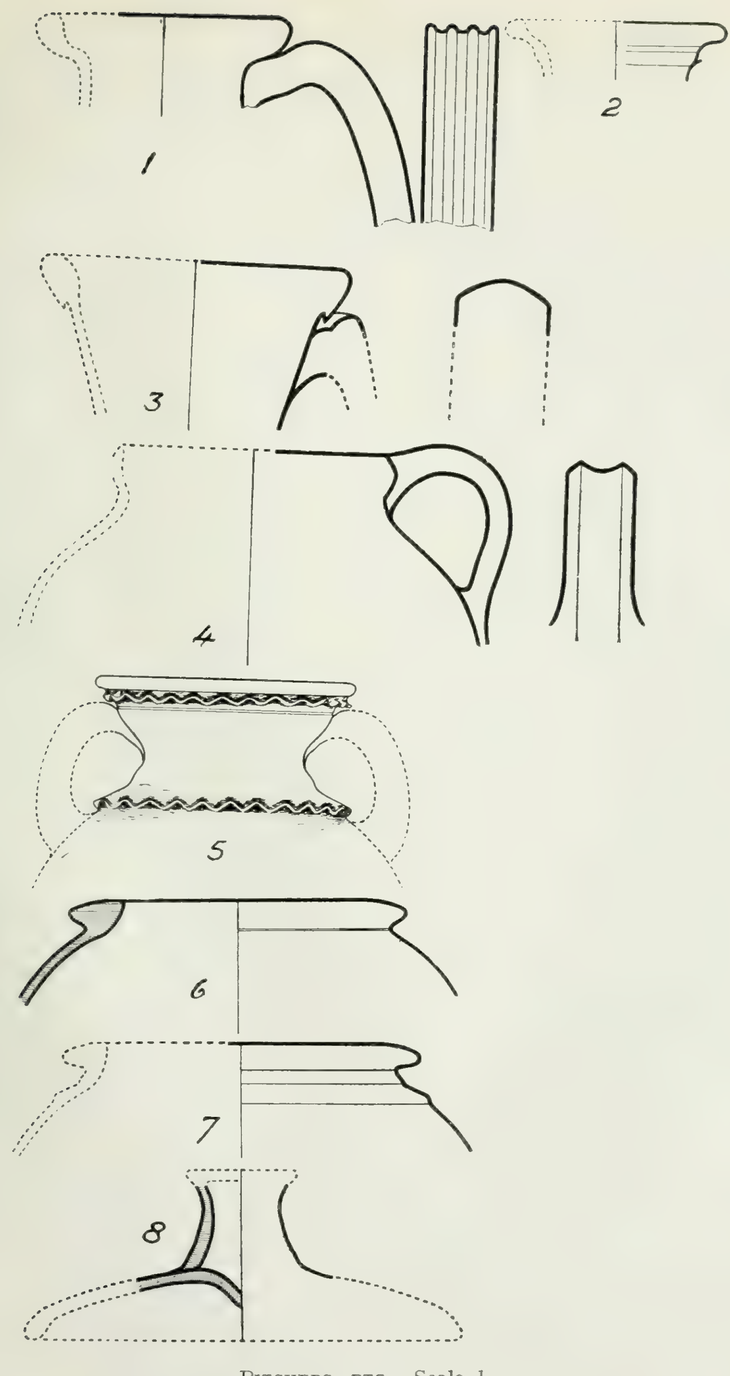
Unglazed Ware

Amphorae and kindred vessels. Amphorae, being imported vessels, offer the same wide field for comparison as Samian ware. Though pieces of amphorae were found in great abundance, few were large enough to give the shapes of the vessels they had belonged to. The three principal varieties appeared to be all represented, though two of these were certainly rare. One piece (pale yellow ware) seemed to be part of the conical foot of the tall narrow type of amphora, which, though the earliest type of all, is found here and there throughout the second century, and appears in a degenerate form at Niederbieber (Oelmann, type 77). Another fragment (yellowish ware) showed a base tapering to a short stumpy foot little more than 3 in. in diameter (Oelmann, type 76). These, however, were single examples. Such other fragments as gave any shape at all indicated vessels with heavy projecting mouthpieces, short necks, short plain handles more or less round in section, bulging sides and rounded bottoms (Oelmann, type 78). This is the common form on the Monte Testaccio at Rome, where the vessels are mostly of the second half of the second century and

PLATE XXXVIII.



VESSELS OF UNGLAZED WARE.



Pitchers, etc. Scale $\frac{1}{4}$.

the first half of the third. The upper part of an amphora of this type is shown, Pl. XXXVIII, No. 2. A somewhat finer vessel is indicated by the fragment No. 4, in which the handle is two-ribbed and rather longer than in the other, while the material (reddish ware) is less coarse.

More satisfactory matter for comparison is given by the potters' stamps. Six such stamps were found on amphorae handles. One was quite illegible; for the others see Pl. XL, *A*, Nos. 1-5. No. 5 is fragmentary, and No. 4 is blurred and indistinct. The middle letter of No. 4 has probably been M, as *O.R.L.* 'Wimpfen,' Pl. III, Fig. 15, a stamp which is widely distributed on the Continent. In Britain the letters Q M R have been found on amphorae handles at Ambleside and (retrograde) at Papcastle.[1] No. 3 occurred at Bar Hill, while No. 2 (which turned up three times in the Annexe) has been noted at Bar Hill, Castlecary and Newstead. Nos. 1, 2 and 3 all occur on the Monte Testaccio. There No. 2 appears on an amphora which has a consular year painted on it.[2] This amphora is one of a group giving the date *Aurelio iii et Commodo ii cos.*, *i.e.* the year 161. The stamp has also been found on the Moselle at Neumagen,[3] a point on a route by which many amphorae, with their contents, would probably reach our province.

With the amphorae may be grouped a few pieces belonging to pitchers and storage vessels of coarse ware (Pl. XXXIX). Whether Nos. 1-3 have had two handles or one is uncertain. No. 1 is of a coarse red ware. The smaller variety No. 2 represents a few fragments in red and yellow ware, one or two showing traces of a cream wash. No. 3 is of a gritty, light-grey paste with a brownish coating. The wide-mouthed, neckless vessel No. 4 is of a hard, rather thin, red ware, burned blue-grey at the core. One or two other fragments belonged to this type. Some half a dozen pieces of rather coarse yellow-to-red ware belonged to jars like No. 5, ornamented with frilled cordons under the rim and (or) on the shoulder. Nos. 6 and 7 have had no handles; fragments of such jars came from the Fort Bath-house and the adjoining ditch; they were of red or yellowish-red ware. No. 8, of similar ware, is a fragment of a lid which had served as a cover

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[1] *Ambleside II*, p. 57; *Cumb. Trans.* N.S. xiii. p. 137.

[2] *C.I.L.* xv. 4349. [3] *C.I.L.* xiii. 10002, 316.

for wide-mouthed vessels like Nos. 6-7. Two such fragments were found. In each case the handle had been made separately and attached.

Mortaria. Here, as with the amphorae, the most satisfactory material for comparison is given by the stamps. Over twenty potters' stamps were found on mortaria rims, some occurring more than once. A few were entirely illegible. The others are illustrated, Pl. XL, *B*. For the types on which they occur see Pls. XLI-XLII.

1, 2, 3. Herring-bone or conventional leaf pattern. No. 1 on type 32, No. 2 on type 31, No. 3 on type 27. Similar stamps occur on second-century types at Silchester. Also at Poltross Burn, Newstead, Bar Hill, Ardoch and elsewhere.

4. On type 26. More than once at Newstead. A stamp EME (retrograde) has been recorded at Wilderspool, near Warrington (May, *Warrington's Roman Remains*, p. 64).

5. Twice on type 12. At Newstead.

6. On type 5. At Newstead and Wilderspool.

7. On type 22 and twice on type 24. At Bar Hill on rim similar to our type 24.

8. On type 4. At Newstead.

9, 10. LOCCI·PR (retrograde). No. 9 on rim like type 14 and on type 26. No. 10 three times on type 26. On amphorae PR(*aedia*) indicates the property from which the raw material has been derived. This stamp, apparently not noted elsewhere, occurred oftener than any other at Balmuildy, in each case on a rather large vessel of a close-grained, hard-baked, whitish-grey paste with buff slip ; black grit.

11. Three times on type 7. Also at Bar Hill, Rough Castle, Newstead, Birrens, Corbridge and Aldborough (*C.I.L.* vii. 1331, 105).

12. On small fragment of uncertain type ; whitish-grey paste, buff slip. Perhaps a variant of No. 11.

13. FIGOBAT . . . ? On a fragment of uncertain type ; hard, whitish-grey paste, buff slip. FIG, for *fig*(*linae*) is common on amphorae. The stamp does not seem to have been recorded elsewhere.

14. . . . ASI (retrograde) ? On type 13. The stamp ITOCASI occurs retrograde in "rough lettering" at Wilderspool and York (*York*, p. 100).

15. On type 20.

16. ENILLI (retrograde) ? Twice on type 13.

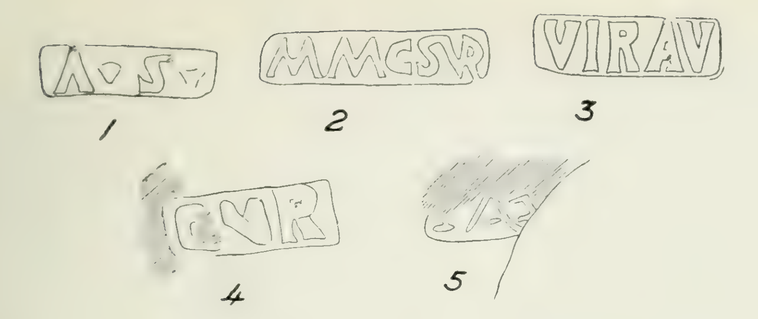
17. AVS ·· / MA On types 10 and 17. Badly impressed, as also at Bar Hill, where it occurs on vessel like our type 10. Also at Camelon and Carlisle.

18. On type 27.

19. On type 19.

20. On type 27.

21. On small fragment (red) of uncertain type.



A. Potters' Stamps on Amphorae. Scale ½.

B. Potters' Stamps on Mortaria. Scale ½.

It will be seen that not more than eight of our stamps can be recognised as occurring elsewhere, none of them outside of Britain. It is only in first and early second-century deposits that continental mortaria-stamps are found in Britain. Mortaria, largely imported throughout the first century, were made within the province in the Antonine period. By this time, indeed, localisation seems to have gone still further. Stamps that occur on Antonine sites in the north are hardly to be met with in the south. Our examples illustrate that. The palm-branch of Nos. 1-3 (found at Silchester) can be disregarded as a conventional mark. Of the remaining seven none occurs south of Mersey-Humber. On the other hand, five of the seven appear at Newstead. There the source of supply would seem to have been the same as with us. At Corbridge a clay stamp for marking mortaria has been found along with rims bearing the stamp ; and a practically identical stamp occurs at Newstead.[1] The stations in Scotland may have been largely supplied from the region of the English Wall, which is, indeed, about the middle of the area over which our stamps are distributed.

The types figured Pls. XLI-XLII are selected from about one hundred and fifty rims. They are so arranged that those which recall the mortarium of the first or early second century are placed first (Nos. 1-14), while those akin to examples from late second-century or early third-century deposits are placed at the end (Nos. 41-51) ; those typologically intermediate come between. The series illustrates the rapid change that came over the mortarium in the Antonine period, when its manufacture was in local hands. Between the one end of the series and the other, potters' marks disappear (Nos. 33-51) ; hard red or greyish-white fabrics (Nos. 1-14) give place to vessels which are often of a rather soft and crumbly paste, with a poor surface wash mostly rubbed off ; the particles of grit become smaller, and are less firmly embedded in the clay ; the spout (shown by very few fragments of types 34-51) shrinks to a feebly moulded aperture, and there is a marked contraction of the rim, with the result that the profile of the vessel becomes less bold, and there is a great loss in size and weight.

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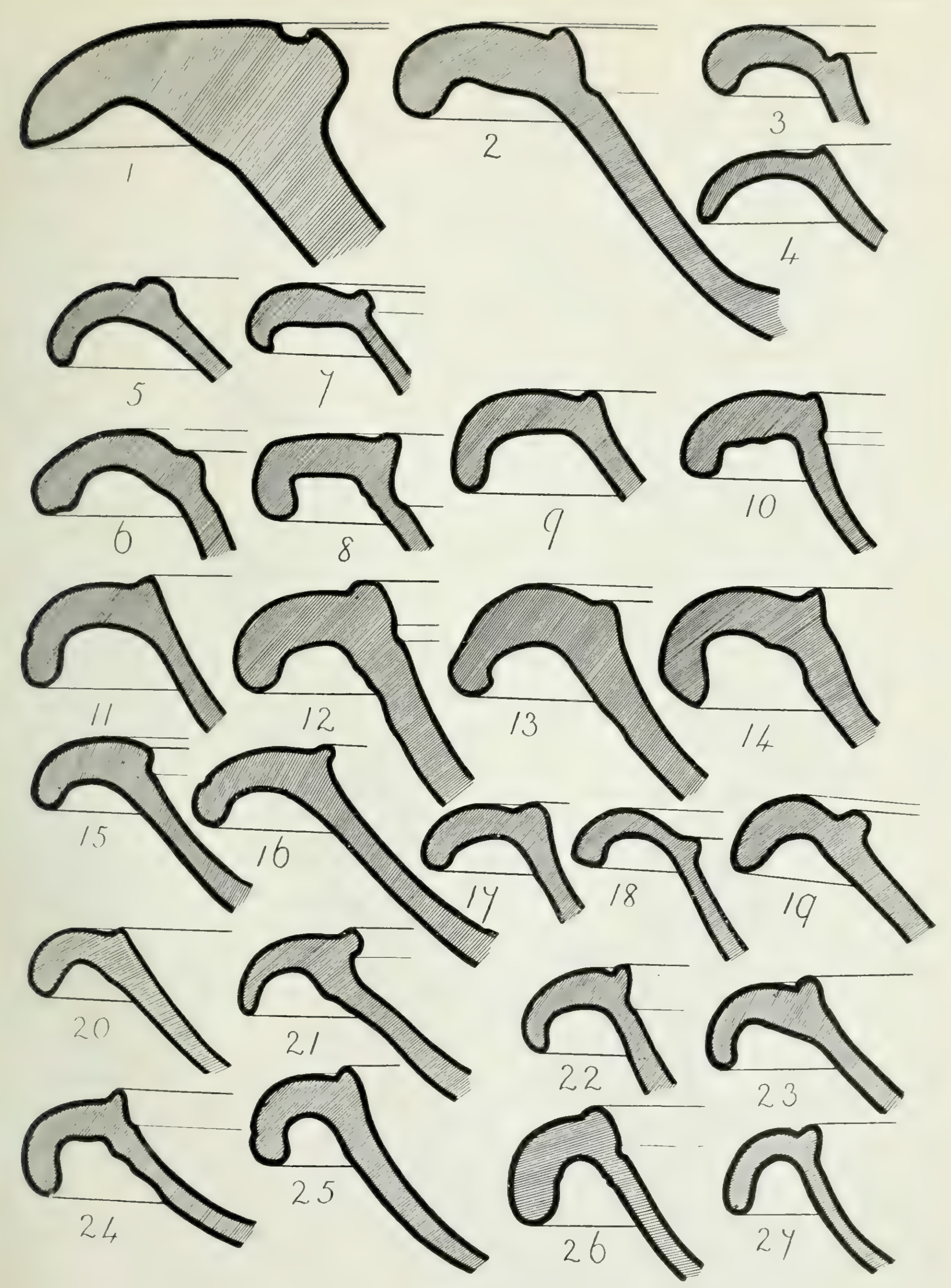
[1] *Corbridge*, p. 194 ; cf. *Arch. Ael.* 3rd series, iv. p. 250, for mortaria of a " white, finely levigated, highly baked clay " of local manufacture found in the " Pottery Store " at Corbridge.

No. 1 is a heavy vessel of red ware (opaque white grit), more than twice the size of any other. Its massive horizontal rim, grooved at the inner edge, marks it out as an early type. It stands quite alone, and must be regarded as a survival. No. 2 (hard greyish-white ware), with wide flat rim, is also probably a survival. The profiles most akin to this early type are Nos. 3-14. These belonged to vessels of hard, red or greyish-white ware, with an average internal diameter of about 9 in. Some rims of this class were roughened with grit like the interior, and one was scored with a series of parallel incisions. Twenty-five vessels in all are represented by these types—about one-sixth of the whole. No fewer than fourteen fragments bore stamps.

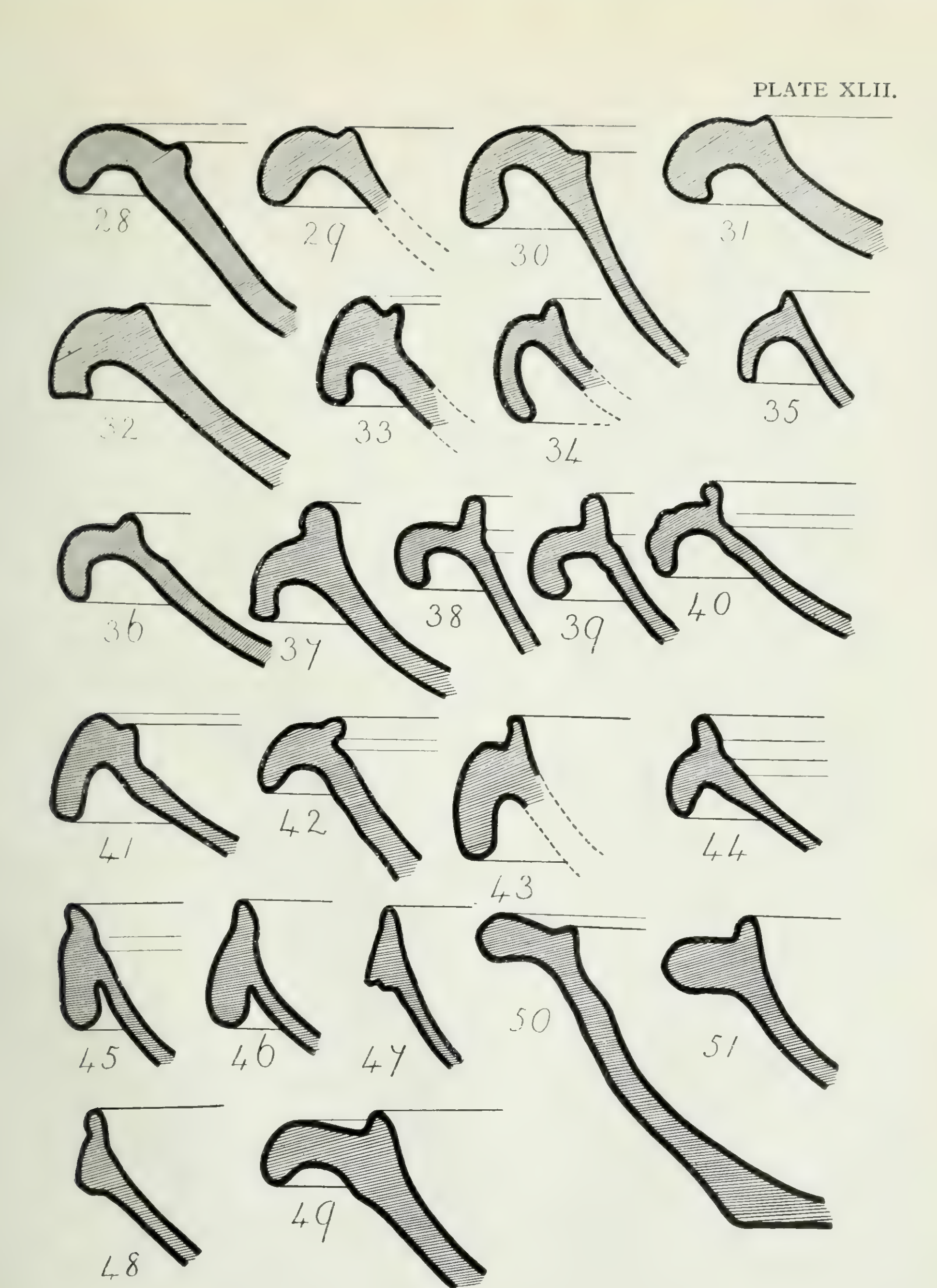
Types 15-33 represent three-quarters of our mortaria. As arranged on Pls. XLI-XLII, these slighter rims are seen increasingly hooked over or bunched up. For the general form see Pl. XXXVIII, No. 6. Such types occurred in a variety of ware, often showing traces of a colour wash. They averaged 8 or 9 in. in internal diameter. No. 15 is peculiar as having no bead. Out of about one hundred fragments of rim only twenty-two showed stamps.

Those two groups (Nos. 3-33) correspond fairly closely with the types, *Wrox. I*, 34-70. The deposits in which the types there illustrated were found indicated that, in Britain as well as on the Continent, vessels with bent-over rims were appearing alongside the type with large horizontal rim quite early in the second century; and they are found at Castleshaw (*Castleshaw II*, Pl. 39, Nos. 29-30) as well as at Gellygaer (*Gellygaer*, Pl. XI, Fig. 1). While profiles like Nos. 19 and 32 were fairly common, Nos. 22-24 are our most representative types.

In types 34-37 (single examples) a high bead surmounts the hooked-over rim. With No. 37 compare *Wrox. I*, No. 106 (from Corbridge), assigned to the later part of the second century. This form passes into a flanged type with Nos. 38, 39 and 40 (flange thrice grooved). In Britain, as on the Rhaetian Limes, flanged mortaria make their appearance in the first half of the second century (*Gellygaer*, *loc. cit.*), but most British examples seem to belong to a later period (*Wrox. I*, Nos. 126-162). Our Nos. 38-40 represent a small homogeneous group of seven or eight vessels of a thin,



SECTIONS OF RIMS OF MORTARIA. SCALE ½.



SECTIONS OF RIMS OF MORTARIA. SCALE ½.

fairly hard ware of close-grained texture, with a reddish-brown colour wash. They had an internal diameter of rather over 8 in.

Nos. 41-51 were quite exceptional, nearly all of them single examples. It is in deposits of the late second and early third centuries that parallels are to be found. With No. 41 compare *Poltross Burn*, Pl. IV, No. 10, found at the "Second Period" level (180 onwards). The bent-over rim tends to straighten to an oblique collar, and this, when combined with a prominent bead as in No. 42, produces a profile which approximates to that of the hammer-head type of mortarium. No. 42 is intermediate between *Wrox. I*, No. 102 (from Corbridge) and No. 114 (from Wroxeter); these are assigned to the late second century. Both Nos. 41 and 42 are rather small vessels of a soft creamy-white paste showing traces of a reddish surface wash. Nos. 43-48 are also rather small vessels; they are of red or yellow ware with a cream surface wash. Nos. 45-48 are of a type that occurs in the late second-century deposit at Corbridge (*Corbridge*, Fig. 8, Nos. 108-9), and are akin to *Silchester*, Nos. 132-3, which may date to the early third century. Such profiles foreshadow the wall-rim type of mortarium (*Wrox. I*, Nos. 218-238). Mortaria with short horizontal rims like Nos. 49 (yellowish-red) and 50 (pale yellow paste, reddish-brown wash), with the flanged variety No. 51 (red), are also to be found in deposits later than our own. With Nos. 50-51 compare the Niederbieber type, Oelmann, p. 69, Fig. 53, No. 1.

Niederbieber takes us far afield. Most of our illustrations have been drawn from the area within which our stamps occur. But reference has been made to examples from Wroxeter and Silchester, and it would be easy to multiply parallels from within the civilian area. Indeed close parallels to every one of our types could be cited from Continental deposits. These potsherds testify, in their fashion, to the singular homogeneity of Romano-provincial culture in the west in the period of the Middle Empire. Second-century mortaria show many varieties of profile, but everywhere much the same varieties recur. This is, perhaps, mainly due to the fact that the mortarium, or *pelvis*, a distinctively Italic vessel not very amenable to local influences, took little development in native hands, and suffered everywhere alike a mere deterioration. Still, native developments do

appear, and it is significant that they have, as a rule, more than a merely local distribution. The colour-coated, flanged mortarium that develops along the Rhaetian Limes in the first half of the second century, under the influence of an early Belgic form,[1] appears in much the same shape in Britain at about the same time; and later (third-century) Rhaetian examples of the type can be closely paralleled from British sites from Pevensey to Ambleside and Corbridge. From Tyne to Danube extended the area of interaction of Italic and La Tène elements, but such interaction could hardly have resulted in this strict correspondence of form and coincidence of date without close and continuous intercommunication.

Jugs (Pl. XLIII). No. 1 was the only recognisable example of a two-handled jug (white clay, cream slip). The stepped and grooved mouthpiece is sharply set off from a rather short cylindrical neck, to which is attached on either side a quarter-round, two-ribbed handle with double groove running down the middle. A faintly incised girth-groove marks off the high, keeled shoulder from the body. One or two small fragments belonging to this jug were parts of a cut-away base of about the same diameter as the shoulder, and therefore indicated a barrel-shaped body like Koenen, Pl. XV, No. 21, though our jug has a distinctly earlier character than the example there figured.

Most of the fragments had belonged to flagons with a single handle. The pieces were either of white or of red clay, a number of those in red clay showing traces of a buff or cream slip. All were very fragmentary. Only one (No. 7) showed part of the body as well as the neck, a fracture invariably occurring at the junction, where the sides thin off.

Like the mortarium, the handled jug or flagon, imported from abroad in the early part of the Roman occupation, was being made within the province before the Antonine period. A waster from the Silchester kilns, for example, is dated by its form to about the end of the first century.[2] But the jug, like the mortarium, was an Italic vessel that did not lend itself freely to native developments, and in local hands it passed, for the most part, through a process of mere decline. The several stages of that process

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[1] Drexel, *O.R.L.* 'Faimingen,' p. 97.

[2] *Silchester*, Pl. LXXIX, No. 1.



Jugs. Scale 1/3.

were everywhere so uniform that comparative material can be drawn from a wide field.

The jug of the Flavian-Trajanic period is distinguishable at a glance from the jug of the third century. It is to Antonine sites like Balmuildy that one looks for an index to the change, and such an index is, in fact, supplied by our examples, few and fragmentary as they are. Out of about fifty pieces less than half showed a significant part of the profile, yet our series serves well enough to indicate the stages of modification. See Nos. 2-10.

No. 2 (white clay, cream slip) and No. 3 (red clay, cream slip) are of the funnel-shaped, " screw-neck " type of flagon. A common form on first-century sites, the type survives, somewhat modified, well into the second century, and is found in Hadrianic deposits both in Britain and on the Continent. At Balmuildy Nos. 2 and 3 were our only certain examples, though a fragment of a four-ribbed handle and two bases showing foot-rings (all white clay) may have belonged to jugs of this type. Of the screw-neck jugs found at Newstead there was only one that might have belonged to the Antonine occupation,[1] while the Heddernheim kilns have yielded no example.[2] The type, it would appear, was becoming uncommon about the time our Limes was constructed, and probably Nos. 2 and 3 are to be assigned to the earlier part of our occupation.

Nos. 4 and 5 show a marked divergence from the typical screw-neck flagon. Mouthpieces of the same profile as our No. 4 occur in jugs from Slack and in the earliest of the jugs in the large Corbridge deposit.[3] On our site two examples were found in white clay and one (smaller) in red. No. 5 (red) preserves little trace of its derivation from the screw-neck jug ; for similar Antonine modifications of the type, see *Poltross Burn*, Pl. IV, No. 12, and *Corbridge*, Nos. 89-90. In No. 6 (one in yellow clay, darker slip ; one in red clay, buff slip) a funnel-shaped mouthpiece shows horizontal scorings that recall the mouldings of the screw-neck jug, but the form has become quite featureless ; cf. *Hedd. Mitt.* iv. p. 134, Fig. 20.

[1] Curle, p. 262, No. 8.
[2] *Hedd. Mitt.* iv. p. 133.
[3] *Slack*, Pl. XXIV, No. 113 ; *Corbridge*, No. 88 and p. 178.

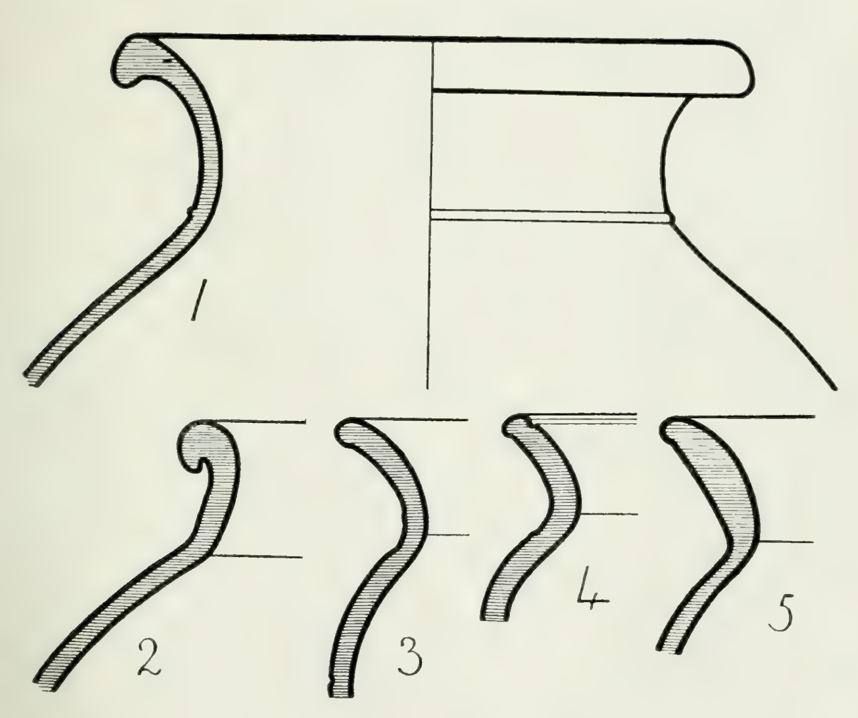
The short-necked globular jug No. 7 has a three-ribbed handle bent to a half-circle. It has a sharply moulded cylindrical mouthpiece, thrice grooved, and shows a series of parallel grooves on the shoulder. It is a jug with somewhat mixed characteristics, and stands rather outside the development which our series illustrates. It is singular among our jugs in being of a fumed, grey-black ware.

With Nos. 8-10 we pass to the jug with ring-mouthpiece, grooved (No. 8) or plain. Our examples are far removed from their first century prototype, Koenen, Pl. XI, 25-6, which is represented among the early ware at Newstead.[1] Most of our jugs had been of the types 8-10. Jugs with grooved ring-mouthpieces like No. 8 were found at Bar Hill, and similar jugs occurred among the later ware at Newstead, while they composed the largest class in the Antonine deposit at Corbridge.[2] At Niederbieber, on the other hand, they were exceptional.[3] In the example illustrated (red clay, cream slip) the neck passes into the body in an exceptionally wide, continuous curve, suggesting a shape like an inverted pear, as *O.R.L.* 'Cannstatt,' Pl. VI, No. 34; but the contour of our vessel as a whole is quite uncertain. The mouthpiece is sharply set off from the neck and is slightly undercut. In No. 9 (brick-red) the mouthpiece is a plain ring, while in No. 10 (red clay, cream slip) it is little more than a mere thickening of the lip, immediately below which is attached a plain handle hollowed down the middle. The two pieces illustrated show only the mouthpiece with part of the neck, but seven other fragments (red ware), which had probably belonged to the type 9-10, gave the junction of neck and shoulder. In five of these the neck was distinctly marked off from the shoulder, in one case by a raised band or ring; and all these fragments suggested the short-necked, high-bulged (pear-shaped), top-heavy form such as was produced at the Heddernheim kilns, is common on Pius sites on the Continent and is found on the Outer Limes, but is exceptional at Niederbieber and Holzhausen.[3] In the remaining two fragments the neck curved

[1] Curle, Pl. XLIX, Figs. 2-4. For intermediate (Hadrianic) examples, see *O.R.L.* 'Heldenbergen,' Pl. III, Nos. 2, 6 and 41, and p. 15.

[2] Curle, p. 262, Nos. 14-15; *Corbridge*, Nos. 98-9.

[3] Oelmann, type 61; *O.R.L.* 'Holzhausen,' Pl. V, No. 18.



Sections of Rims of Urns. Scale ½.

gradually into the shoulder, as in Koenen, Pl. XV, No. 15, but in both our fragments the bulge of the shoulder appeared to have been fairly considerable, and neither indicated the elongated shape which is characteristic for the period of Niederbieber and the Regensburg burial-ground,[1] and is found in the Rhenish graves of the third century disputing the growing encroachment of glass.[2]

Urns (Pl. XLIV). Many hundreds of fragments had belonged to olla-shaped vessels. Urns, or large ollae, composed a comparatively small proportion of the whole. The commonest profile was No. 1, a type represented at Traprain Law as well as at Newstead.[3] A good many of our examples of the type were of black fumed ware, but the majority were of a comparatively fine red fabric, some of them, like the example illustrated, showing a raised cordon at the junction of neck and shoulder, others a single or double groove. To type 2 (diam. $5\frac{2}{3}$ in.)[4] about ten fragments belonged, all of a rather thick fumed ware.

Nos. 1 and 2 are distinct in profile from the smaller ollae. No. 3, on the other hand, is like a large example of a common type of cooking-pot (see below) and is of the same hard, fumed ware. It shows a girth-groove below the shoulder. Over a dozen urns, both fumed black ware and plain red ware, had been of this type. No. 4 (two examples in red ware) is a variant distinguished by a groove at the top of the rim inside. The other variant, No. 5, is a single example (hard fumed ware). In Nos. 3-5 the diameters (from 9 in. to 11 in.) are much larger than in Nos. 1 and 2, and the projection of the body beyond the rim is very slight. Most urns had been provided with foot-stands.

Pots and Jars (Pl. XLV). The majority of our fragments of ollae had belonged to pots or jars with an average diameter of 5 in. or rather more. In general, the measurements given by our fragments indicated proportions for our vessels which agreed with those described as characteristic of the

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[1] Oelmann, type 62; Lamprecht, Pl. XII, No. 1.

[2] See the Cologne series, *Bonn. Jahrb.* 114-5, Pls. XXIII-XXV and pp. 349-50.

[3] *Proc. Soc. Ant. Scot.* l. (1915-16), Fig. 18, No. 1; Curle, Pl. L A, No. 3.

[4] The diameters given for ollae are the external diameters at the mouth.

Antonine period,[1] though individual pieces made the range of variation a wide one. The rim-sections on Pl. XLV are a selection from over four hundred pieces which gave the profile of rim and shoulder.

Four-fifths of those vessels were of a grey-to-black fumed ware. In nearly one-half of these the rim was turned out from the shoulder in a continuous curve, as in Nos. 1-3. No. 1 was much less common than No. 2, and that again than No. 3, which is our characteristic profile. The usual material was a rather fine, grey or blue-grey fumed ware, with the surface burnished to a metallic polish and scored with a lattice pattern. The ledged shoulder seen in No. 4 was more common in the group 13-16 (see below). No. 5 was exceptional.

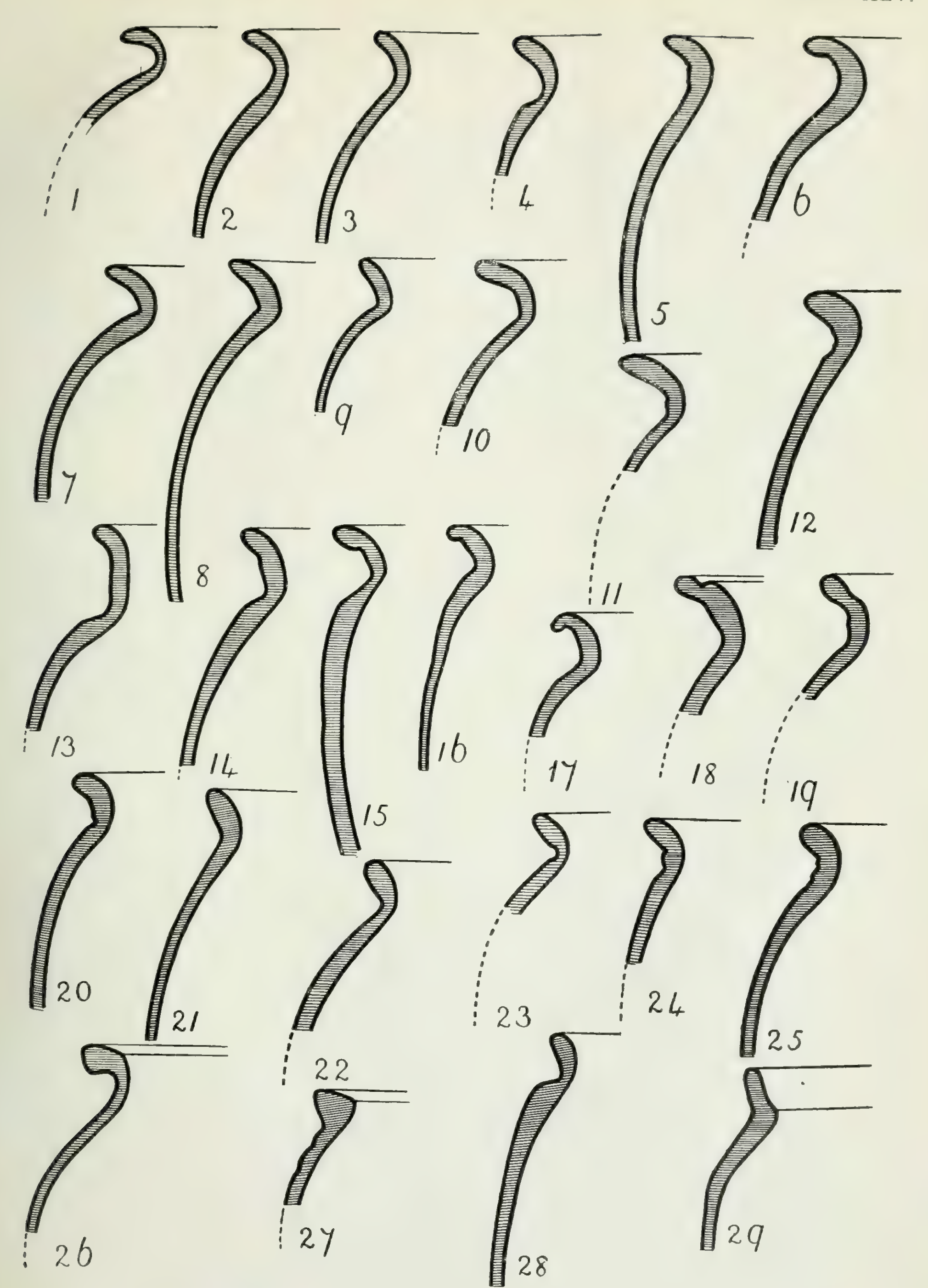
In Nos. 7-9 the rim is bent out from the convex shoulder in a quarter-round or more open curve. This group comprised about one-quarter of the fumed-ware pots, and No. 8 was the commonest member of it. These were the pots most commonly found caked with soot. Most of them seemed to have been somewhat larger than pots 1-3. They were of a hard black fumed ware ; the shoulder was polished, but the polish had not the metallic quality common in Nos. 1-3. The body was usually scored with a lattice pattern. Nos. 10 and 11 were exceptional.

Another common profile showed a distinct neck marked off from lip and shoulder, as in Nos. 13-16. Such pots resembled Nos. 7-9 in size and fabric, and, like them, composed about one-quarter of the pots. The slight constriction below the shoulder seen in Nos. 15 and 16 occurred oftener in this group than in any other, but was not common. More common was a distinct ledge at the top of the shoulder, as in No. 15. Another common feature was a zigzag or wavy line round the neck, a La Tène feature that reappears on pots of the time of Hadrian and Pius.[2] No. 17 was exceptional.

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[1] *York*, p. 93 ; *Silchester*, p. 303.

[2] This feature did not occur in the early pots at Newstead, nor has it been noted in Flavian-Trajanic deposits at Corbridge or Wroxeter. It is equally absent from the later levels on the English Wall (Simpson, p. 348). On the other hand, it appears on cooking-pots at Slack (*Slack*, p. 62), where it cannot be later than Hadrian's reign. It is common on the English Wall at the First Period level, but less common in the Antonine deposit at Corbridge (*Corbridge*, p. 176).



SECTIONS OF RIMS OF POTS AND JARS. SCALE $\frac{1}{2}$.

The three groups described are common on the English Wall as well as at Newstead. Another type found on the English Wall is No. 20, which shows a slight offset or groove at the junction of rim and shoulder.[1] Our example represents over a score of fragments, all of the same fabric as Nos. 1-3 and all belonging to pots of about 5 in. diameter. Other profiles which occurred in fumed ware (once each) are Nos. 24, 25, 27 and 28, all of a hard black polished fabric. The profile of No. 28 was not uncommon in vessels of beaker size (see below), and both it and No. 27 represent small pots of about 4½ in. diameter. For all this fumed ware a plain cut-away base like Fig. 12, No. 1, was characteristic.

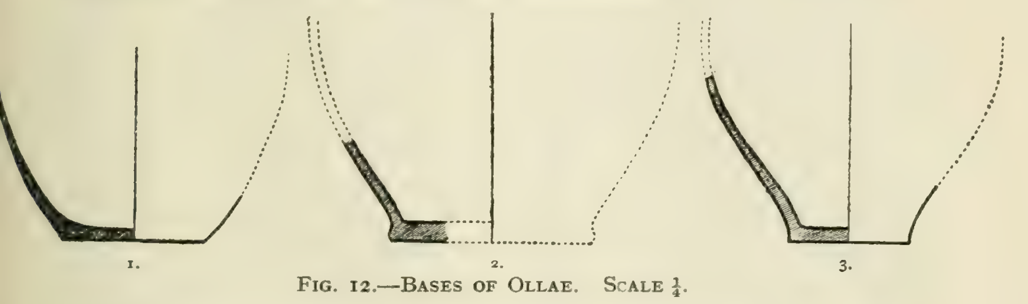


FIG. 12.—BASES OF OLLAE. SCALE ¼.

Most fragments showing rudely formed foot-stands like Fig. 12, No. 2, belonged to plain (unfumed) jars.[2] In a few of the smaller jars the lower part of the body was concave in profile and contracted to a narrow foot, as in Fig. 12, No. 3. Plain-clay jars, in various shades of grey, yellow and red, composed about one-fifth of our medium-sized ollae. The paste was rather coarse and gritty. Some pieces were very hard and had a burnt appearance, while others were soft, crumbly and porous. In profile many were akin to groups 1-3 and 7-9, but the profile was less determinate than in the fumed ware, the rim being less cleanly and firmly turned. Other profiles shown by plain-clay jars were 6 (red), 12 (hard, gritty yellowish-red clay, smoked surface), 18 and 19 (both red), 21-23 (soft red ware), 26 (buff),

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[1] *Poltross Burn*, Pl. IV, No. 19; *Corbridge*, Fig. 6, No. 54.

[2] These bases were roughly wheel-turned. A single handmade example was found in a very coarse, gritty, dirty-grey ware.

and 29 (hard, gritty red). No. 18 shows a groove and Nos. 19 and 29 a hollow at the top of the rim inside, as if to receive a lid, like Simpson, Pl. XVIII, Nos. 117-8.

On the whole, those plain-clay jars were inferior to the fumed ware. This applies particularly to the group of jars of crumbly, porous ware for which profiles 21-23 were characteristic. These numbered a dozen or rather more. One or two specimens submitted to Mr. F. G. Simpson were recognised by him as similar to ware found at the lowest (Hadrianic) level on the English Wall, where it has been noted that the jars improve in technique through the second century into the third, this improvement being accompanied by a revival of native (Late Celtic) features.[1] The close correspondence between our coarser ware as a whole and that of the First Period on the English Wall, with the absence of evidence for an extensive (or indeed any) production of " Roman " pottery along our own Limes,[2] would seem to justify one in supposing that our ollae represent the same industrial area as those on the Tyne-Solway line, and in assigning to this distinctive group of inferior vessels much the same date as the examples found further south. In that case they would have to be attributed to the earliest part of our occupation, since on the English Wall such ware hardly outlasts the reign of Hadrian. It will be noticed that profiles 21-23, which were characteristic for this inferior ware and occurred in no other, are reminiscent of the straight compact rims of the Flavian-Trajanic period.[3]

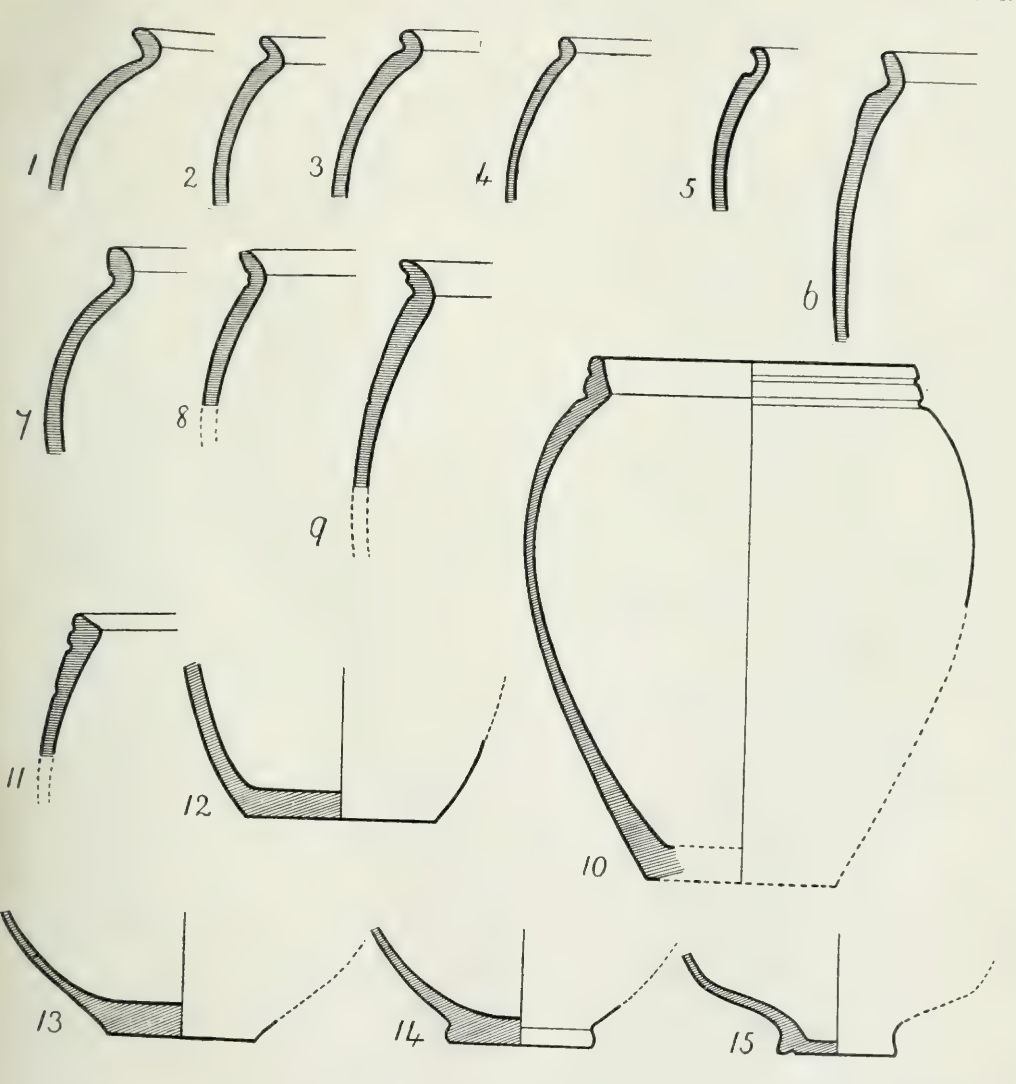
Beakers (Pl. XLVI). Small ollae, or beakers, composed about one-seventh of the whole. No. 10 (see also Pl. XXXVIII, No. 8), with a

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[1] *Poltross Burn*, p. 451 ; Simpson, p. 350 ; *Corbridge*, p. 176.

[2] The kiln uncovered a few years ago at Mumrills had been used mainly for bricks and tiles, and Dr. Macdonald considers it no more than " just possible it was occasionally employed for pottery." See Macdonald, ' Some Recent Discoveries on the Line of the Antonine Wall ' in *Proc. Soc. Ant. Scot.* xlix (1914-15), p. 127. At Traprain Law the evidence is against the " Roman " pottery of the second century having been made in the neighbourhood. *Ibid.* l. (1915-16), p. 141.

[3] Curle, Pl. XLVII, No. 36. For the Hadrianic type on the English Wall see Simpson, Pl. XVI, No. 26, and *Poltross Burn*, Pl. III, No. 26.



BEAKERS. SCALE ½.

diameter of about $3\frac{1}{2}$ in., may be taken as a representative size, though the diameters ranged from nearly 5 in. to 2 in. Many, like Nos. 1-2, showed much the same profiles as the cooking-pots 3 and 8 (Pl. XLV). Commonly, however, the beakers had a distinctive profile. In some, as in No. 3, the everted rim shrank to little more than a bead-lip; in many the rim was more or less upright, as in Nos. 4-7. None of these profiles (4-7) was represented among the cooking-pots except No. 6, and that occurred only in one or two small pots akin to the beaker class. As a beaker profile No. 6 was fairly common; the specimen illustrated has a diameter of $3\frac{3}{5}$ in., but examples of the type occurred with diameters of between 3 in. and 2 in. No. 7 (single example) is a fairly large beaker with a diameter of $3\frac{4}{5}$ in.

Those types correspond to the types *Corbridge*, 56-62, and are common in the region of the English Wall. On our site they occurred in the same varieties of ware as the medium-sized ollae; that is to say, there were a few examples in grey, yellow and red ware, but most were of black fumed ware with polished shoulder, many showing a lattice pattern scored on the body. A dozen pieces, however, composed a distinctive group; No. 8 (diameter 3 in.; two examples), No. 9 (diameter $3\frac{3}{5}$ in.; five examples), No. 10 (five examples) and No. 11 (small fragment; single example). These are of a rather soft, yellow paste coated with a darker (pinkish) slip, now mostly rubbed off. They are grooved round and (or) under the rim, and sometimes (Nos. 9 and 11) below the shoulder. The type is not uncommon on the English Wall, where it usually shows a rough-cast surface. Our fragments show no trace of such a treatment, but in most the surface is worn away. For beakers of similar profile and rough-cast surface, but of a finer fabric, see under "Miscellaneous Ware."

A plain cut-away base was characteristic for the beaker class of ollae, as for the cooking-pots; see No. 12. No. 13 was exceptional. When the sides contracted to a narrow base, a foot-stand was usually provided, as in No. 14. No. 15, which is grooved round the underbase, is part of a thin, hard, grey vessel akin to the finer sorts of beaker dealt with under "Miscellaneous Ware."

Bowls, Plates, etc. (Pls. XLVII-XLVIII). Besides ollae, the common kitchen-ware included some four or five hundred fragments of bowls, pans

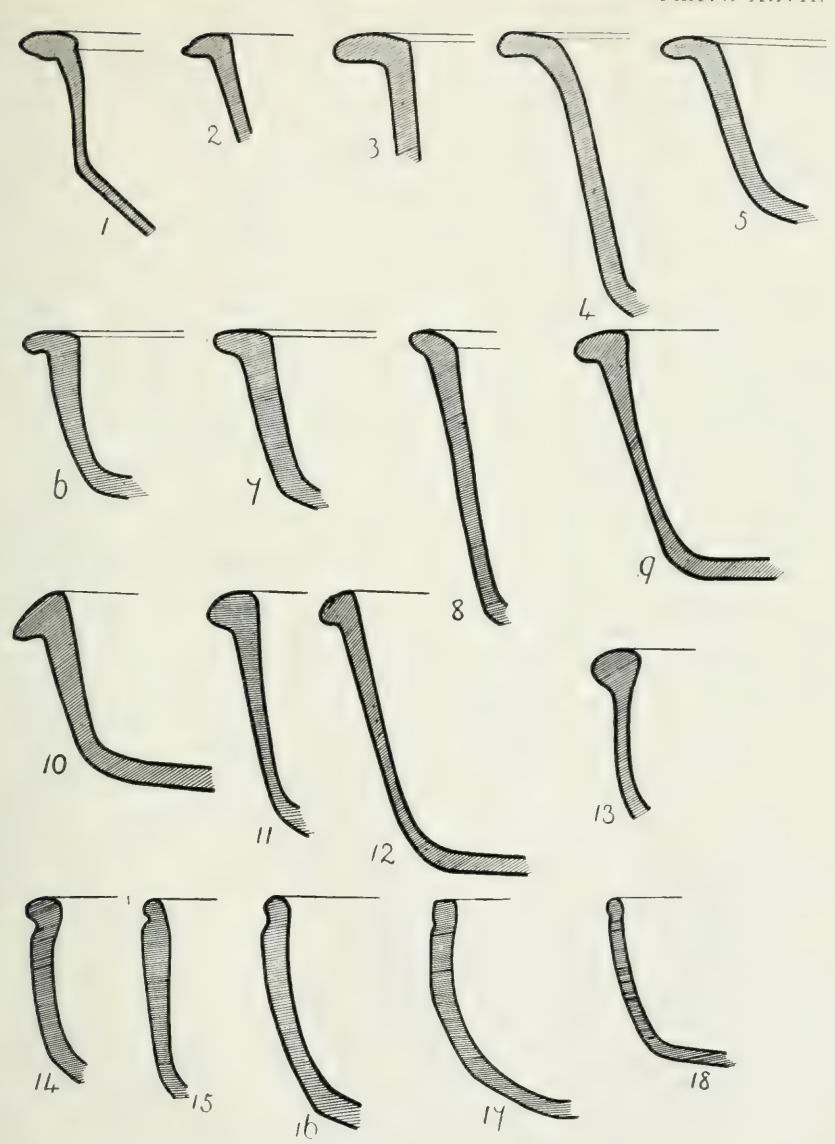
and similar dishes. There were fragments of two bowls of the carinated shape; see No. 1 (thin, hard, grey ware). Such bowls, with the rim reeded or plain, are found as late as the reign of Hadrian,[1] but their occurrence on an Antonine site is exceptional.

The great majority of our pieces had belonged to bowls of the "pie-dish" shape—Nos. 2-19 (see also Pl. XXXVIII, Nos. 1 and 5). The internal diameters at the mouth varied from 8 in. to 4 in., the smaller sizes occurring mostly in types 15-19. Nos. 2-8, which represent about one-fifth of our bowls, show a flat everted rim, without the reeding common on pre-Antonine examples of this, as of the carinated shape, though No. 2 (grey ware) shows a single groove near the outer edge of the rim, like a type found at Gellygaer.[2] No. 2, however, was quite exceptional. Nor were broad, flat rims like No. 3 very common. They occurred mostly in plain-clay ware (grey, yellow and red), much of it of the same soft inferior fabric as was noted in the plain-clay jars 21-23 (Pl. XLV). It was in similar ware, as a rule, that variant forms like Nos. 4 and 8 occurred. Most examples of this flat-rimmed group showed short rims like Nos. 5-7, profiles which, with few exceptions, occurred in hard, fumed grey-to-black ware, often burnished and scored on the exterior with a lattice pattern. That was also the technique in groups 9-13 and 14-16, such examples as occurred in plain-clay ware being mostly of inferior fabric and showing somewhat indeterminate profiles. No. 9 represents a good many examples intermediate in type between the flat-rimmed bowls and Nos. 10-13, which compose a distinctive group. In these the everted rim is replaced by a heavy projecting moulded lip or roll. For our site this roll-rim bowl is the characteristic type. Indeed three-quarters of our fragments of bowl belonged to this group, No. 11 giving, perhaps, the most representative profile. The dishes, as a rule, were comparatively shallow, deeper forms like No. 12 composing a small minority. No. 14 brings us to a third group (Nos. 15-16), to which not more than one-tenth of our bowls belonged. This group shows a bead-rim more or less slightly moulded and defined by a groove. The bowls of this group were often of small size.

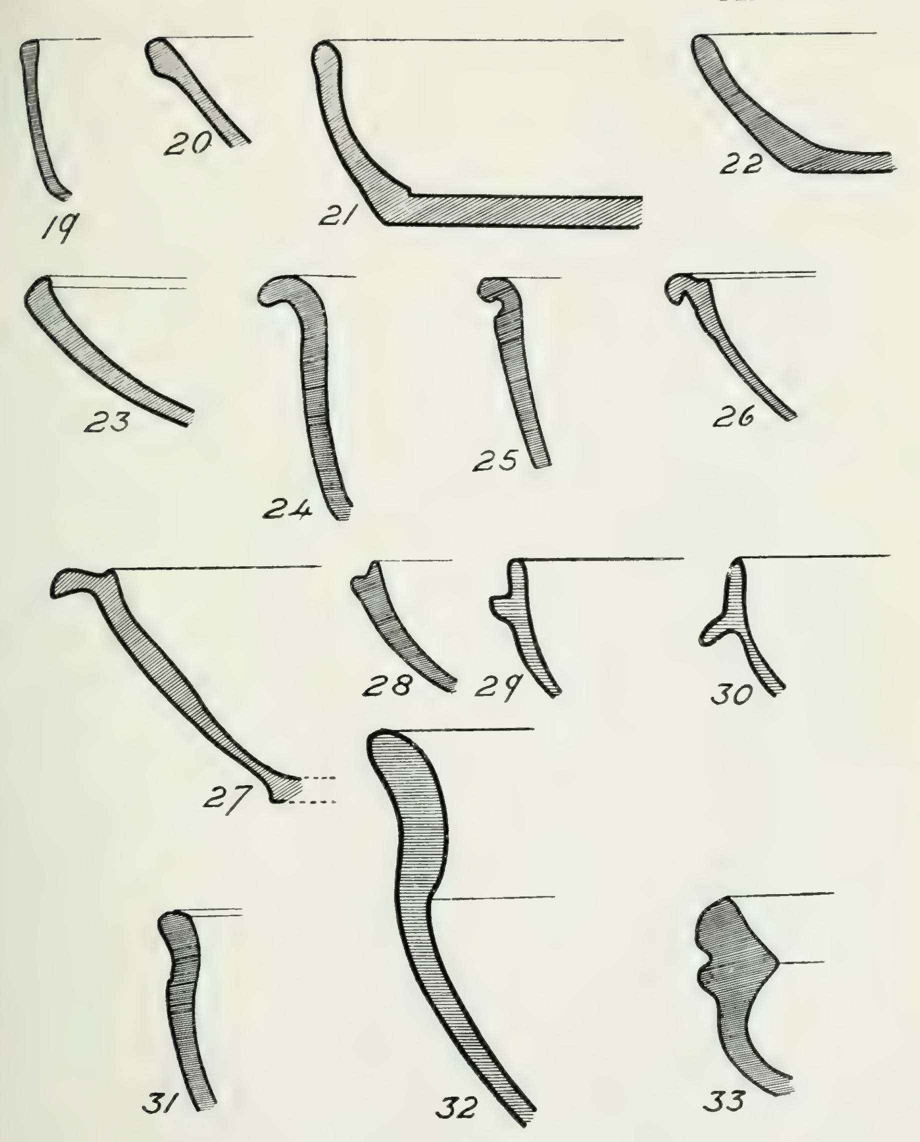
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[1] *Poltross Burn*, Pl. III, Nos. 1-6.

[2] *Gellygaer*, Pl. X, Fig. 8.



SECTIONS OF RIMS OF BOWLS, ETC. SCALE ½.



SECTIONS OF RIMS OF BOWLS, ETC. Scale ½.

Plain flat-rimmed " pie-dishes " had made their appearance at Newstead before the end of the first occupation, and they have been noted in pre-Hadrianic deposits at Corbridge.[1] From such deposits the roll-rim and bead-rim, or grooved-rim, types appear to be absent. All three types, however, are found together from Hadrian's reign onwards.[2] By the time our Limes was constructed the roll-rim type would appear to have been predominant. On our site it was more than three times as common as the flat-rimmed bowl, while in the series of pits excavated in 1913 on the site of the old General Post Office at St. Martin's-le-Grand it was the commonest second-century type.[3]

Dishes like Nos. 17-19 were not common. Some of them were distinctly small bowls. Most of our examples were of the usual " cooking-pot ware " ; one or two were scored with a zigzag. It is a featureless shape, which appears over a wide area at various periods and in various techniques. The same applies to Nos. 20, 22 and 23. No. 20 had belonged to a dish like *Silchester*, Pl. LXXIX, No. 9. In No. 23 the lip is slightly moulded on the inside, as Koenen, Pl. XV, No. 14 *b*. These were single examples (black fumed ware). They belong to the same general type (Koenen, Pl. XV, Nos. 12-14) as Nos. 18-19, but are rather to be classed as pans or plates than as bowls. No. 21 is a little more distinctive, showing an offset inside at the junction of side and bottom ; it is of a pinkish-white paste coated with a soft red slip. For an example in similar technique see *York*, Pl. XV, No. 19. At Corbridge and Wroxeter this type of plate is not uncommon in Flavian-Trajanic deposits, and it occurs at Gellygaer.[4] It does not seem to have been noted on Antonine sites.

Four fragments had belonged to bowls with the rim curved outwards as in No. 24 (gritty red ware, cream slip outside). No. 25 is a smaller bowl of similar ware. Others resembled mortaria in profile, though they

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[1] Curle, pp. 258-9 ; *Corbridge*, types 11 and 44, and p. 170.

[2] All are represented at Slack (*Slack*, Pl. XXIV).

[3] *Archaeologia*, lxvi. pp. 235 ff., and Fig. 15.

[4] *Corbridge*, Pl. XI, No. 19, and p. 171 ; *Wrox. I*, Fig. 17, No. 23, and p. 73 ; *Gellygaer*, Pl. XI, No. 9.

were much smaller and of a finer fabric. Thus, No. 26 is a profile which recalls mortaria of the bead-and-roll-rim type; No. 27 (two examples) shows the same profile as our straight-flanged mortarium, No. 50 (Pl. XLII), while half a dozen fragments had belonged to flanged bowls resembling our mortaria 38-9 (Pl. XLII). The internal diameters of these bowls varied from 4 in. to $5\frac{1}{2}$ in.; they were of a rather hard, gritty, reddish paste, one or two showing traces of a cream slip. Such mortaria-like bowls are not uncommon in second-century deposits.[1] Other varieties of flanged bowl or cup are seen in Nos. 29 and 30, which are of a yellowish-red colour, No. 30 occurring also in grey-black ware. They correspond to the Carlisle types, *Carlisle*, 172-3, which were, apparently, manufactured in that neighbourhood.[2] No. 28 (internal diameter 4 in.) is part of an open, curved bowl with the lip notched or ledged for a lid—a very ancient and long-lived type (Koenen, Pl. IX, Figs. *a* and 3). Our example is of yellowish-red ware. No. 31 (internal diameter $6\frac{2}{5}$ in.) represents half a dozen fragments of the same ware, and a piece of a heavy bowl-like vessel in a hard fumed fabric shows a similar profile (No. 32; internal diameter $8\frac{3}{5}$ in.). No. 33 (two examples; one about 12 in. internal diameter, the other rather smaller) is a large, heavy, pinkish-red dish with a flange bent inwards (as if for a lid or to prevent spilling) and a moulding at a corresponding height outside. It is a peculiar yet widely distributed form. Identical shapes are found in Southern England in New Forest technique, and kindred forms occur on the German Limes.[3]

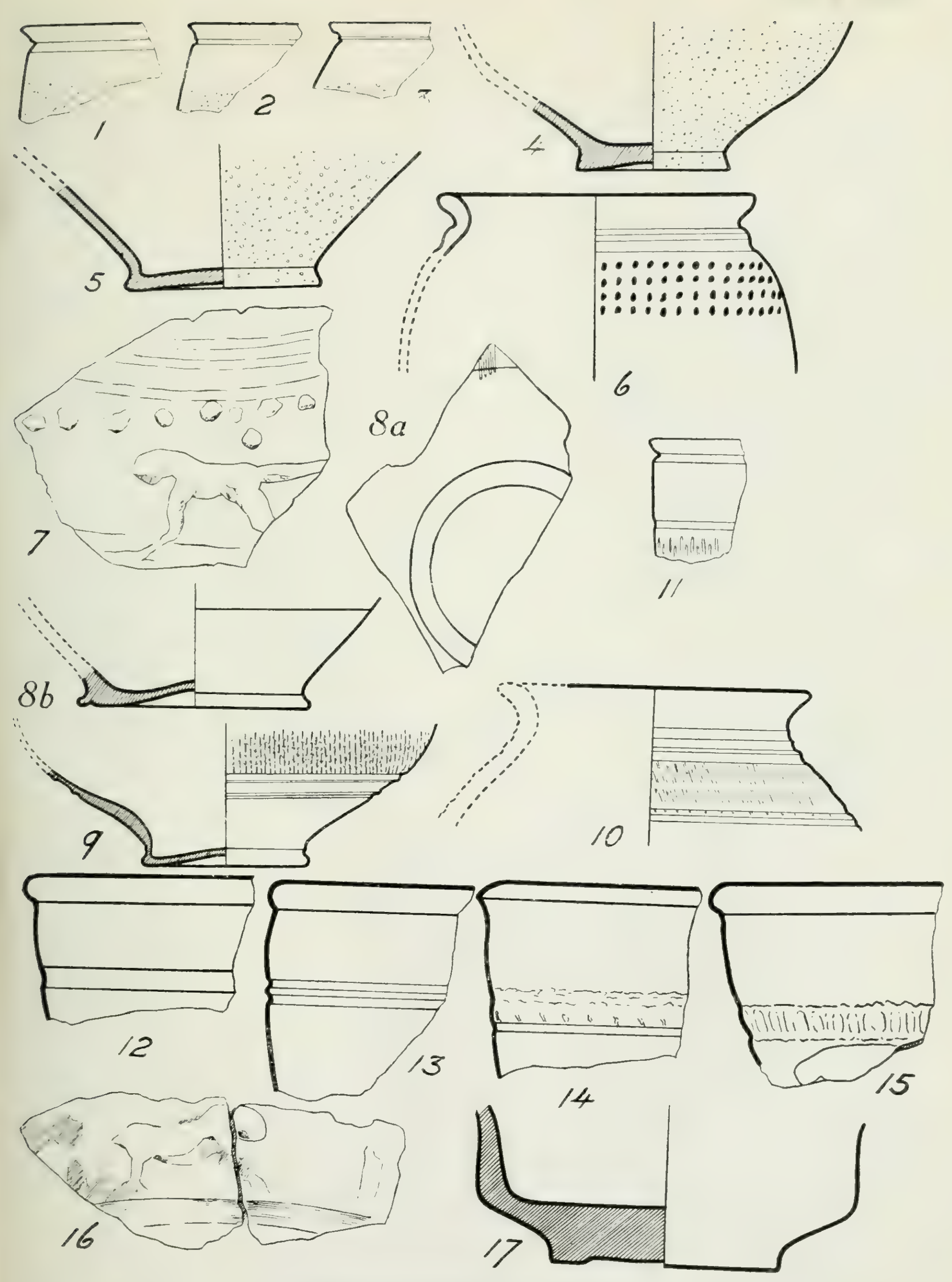
Miscellaneous Ware (Pls. XLIX-L). Some thirty fragments showed rough-cast surface. All were pieces of body except three rims (Nos. 1-3) and two bases (Nos. 4-5); these indicate beakers like *Corbridge*, No. 73, or Curle, type 45, the typical form to which, in the second century, a decorative treatment was applied. The Balmuildy examples were coated either with a black or with a reddish-brown slip. Three of those rough-cast,

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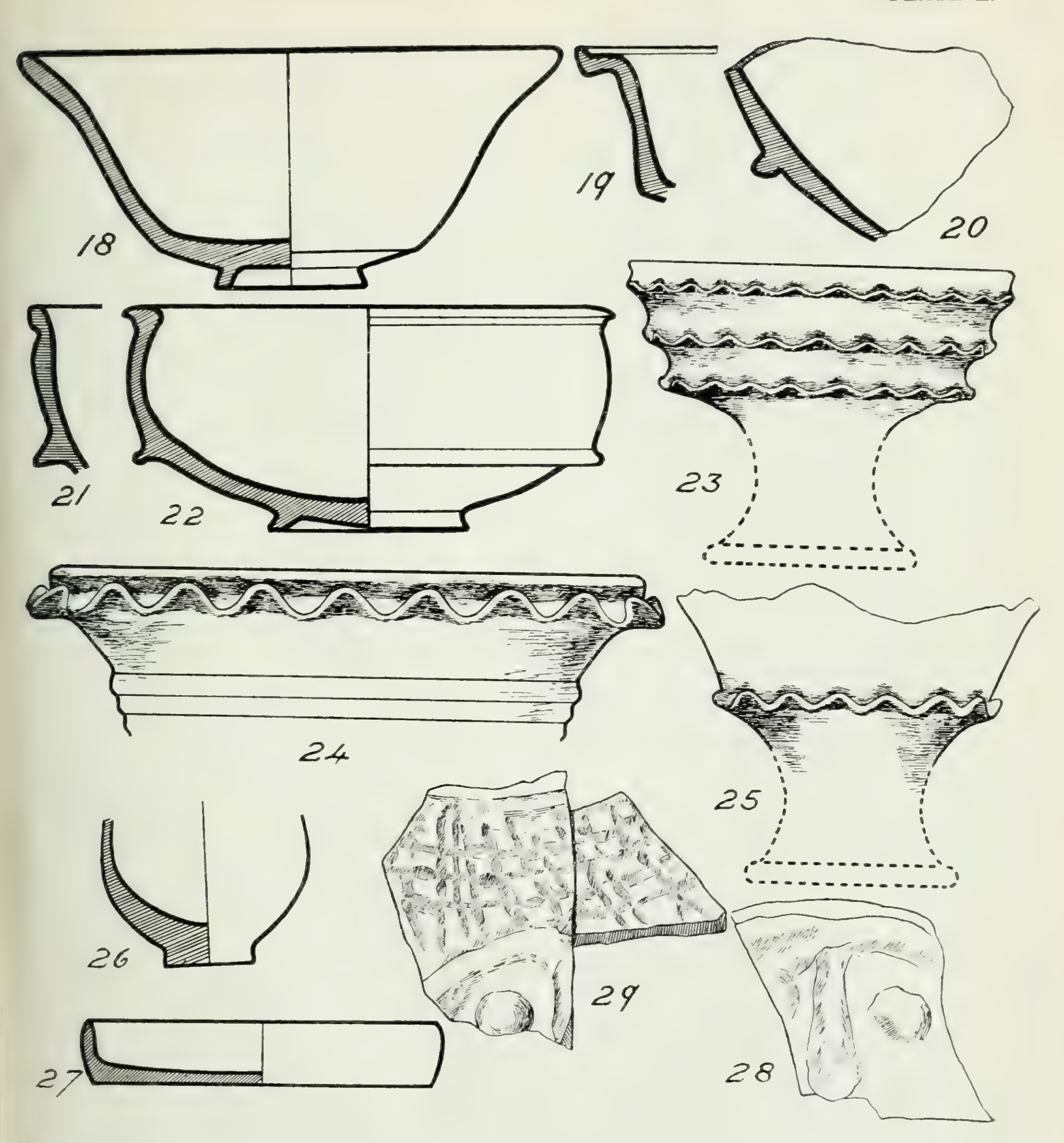
[1] An example from Traprain Law may be noted: *Proc. Soc. Ant. Scot.* l. Fig. 18, No. 2.

[2] *Carlisle*, p. 168; cf. *Ambleside II*, Fig. 21, No. 11.

[3] Sumner, *Excavations on Rockbourne Down*, Pl. X, Nos. 9-10, and p. 39; Oelmann, Fig. 55, No. 13.



Miscellaneous Ware. Scale ½.



MISCELLANEOUS WARE. Scale ½.

colour-coated fragments (two reddish-brown, one black) showed vertical indentations, as also did one fragment of smooth, self-coloured ware (thin, red). Only one very small piece was found of a " Castor hunt-cup " with decoration in barbotine; it showed, with part of a bordering of dots, what appeared to be the forelegs of an animal running to left; it was of the usual pale paste coated with a soft black slip, nearly all rubbed off.

A beaker of grey ware (No. 6) had been ornamented with rows of dots in dark slip. A fragment of a bowl of rather coarse grey-black ware showed decoration in applied relief—a row of dots above a rude figure of a dog (No. 7). Four fragments of beaker showed hatched decoration (Nos. 8-11). No. 8, *a*, *b*, is part of a thin, hard black beaker, which has been ornamented with vertical bands of four parallel lines impressed on the body with a roulette or comb. No. 9, which is of a thin, hard, light-red paste coated with a deep-red (maroon) slip, shows a zone of roulette-hatching round the body, while No. 10 (grey ware) shows a band of oblique hatching on the shoulder. No. 11 is a fragment of very fine, pale ware coated with dark slip, showing below the lip a plain margin defined by a groove, beneath which comes a band of vertical hatching.

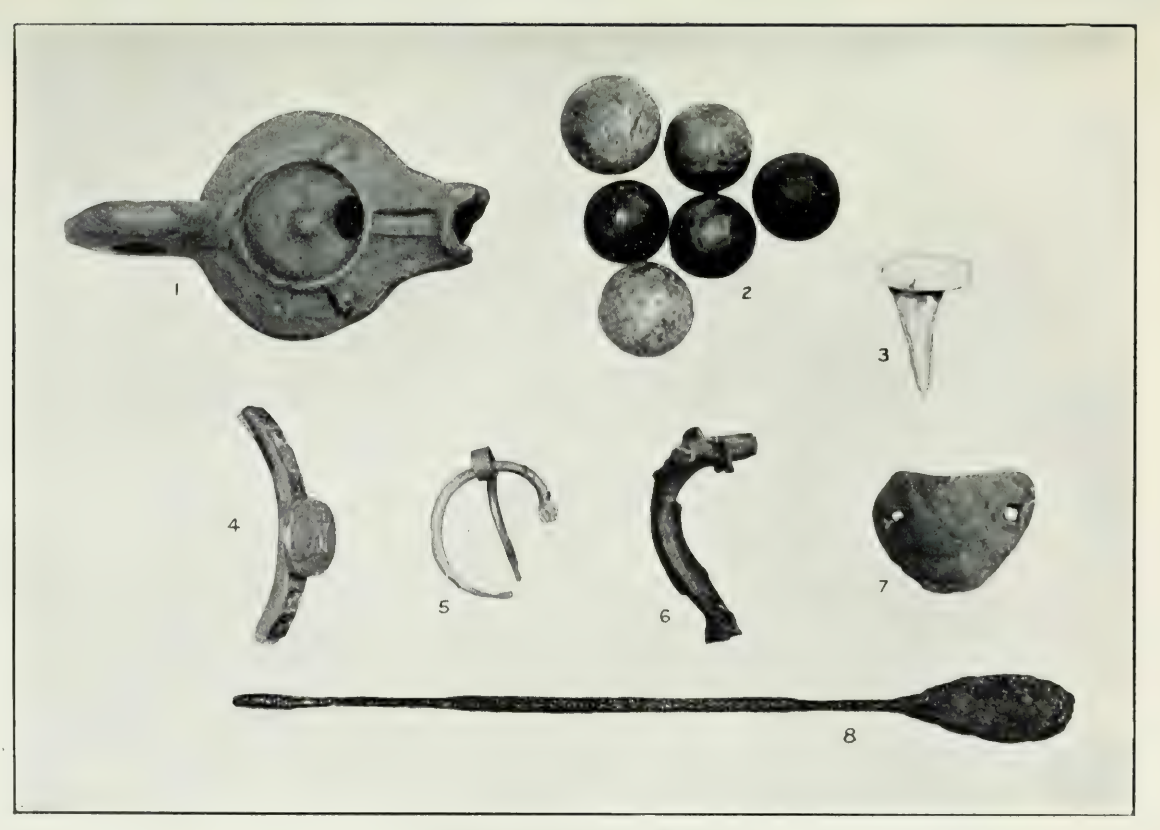
No. 11 somewhat suggests the influence of Samian ware, and various fragments of coarse pottery clearly showed an attempt to imitate Samian shapes and decoration. Some twenty pieces, for example, were obvious imitations of form Dr. 37; beneath a moulded lip came a plain margin defined by a single or double groove, as in Nos. 12-13, while some, like Nos. 14-15, also showed a band of notched ornament clearly intended to suggest the ovolo border of the Samian prototype. Most of those pieces were of red or yellowish-red ware. No. 14, which is of that colour of paste, shows traces of a darker red slip. So also do Nos. 16-19. No. 16, which shows the rude figure of a dog in relief, seems to be an imitation of the Samian form Dr. 30. No. 17 is a base which suggests the same shape, and indeed it may have belonged to the same bowl as No. 16; the two pieces were found together. No. 18 (see also Pl. XXXVIII, No. 10) recalls the Samian cup Dr. 33, and No. 19 is an imitation of the Samian platter Dr. 51. The flanged bowls 20-22 also imitate Samian forms. Several fragments like No. 20 occurred in reddish ware. No. 22 occurred once

in pinkish-yellow ware (see Pl. XXXVIII, No. 11) and once in a fumed grey-black fabric. No. 21 is fumed black ware.

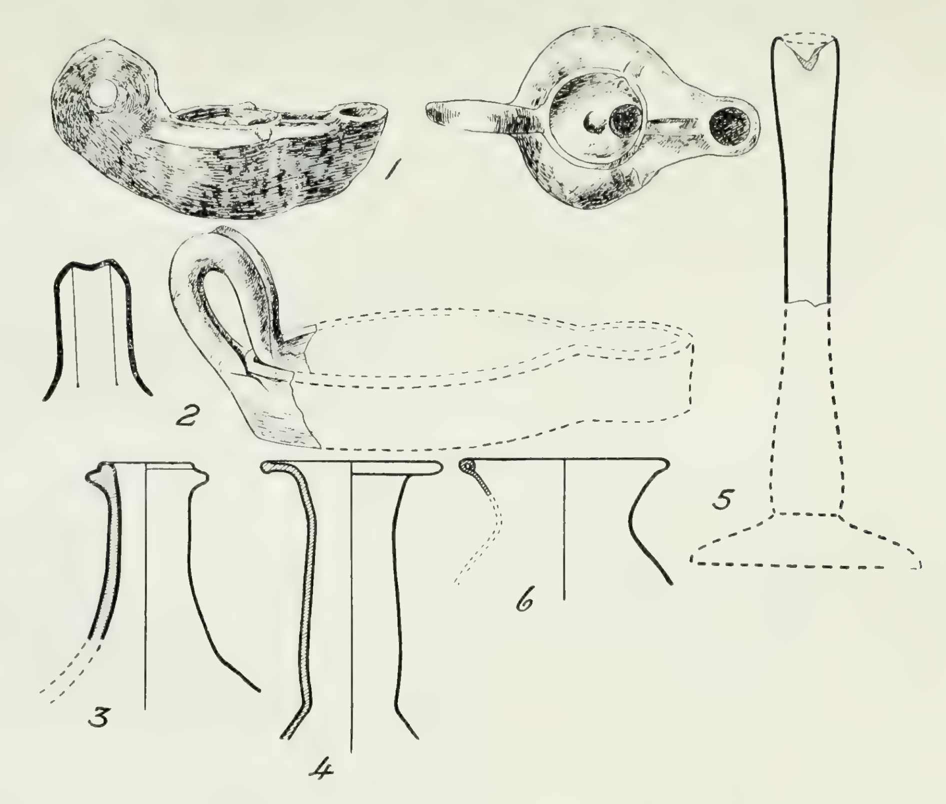
A number of pieces of thin, pale-coloured paste coated with buff slip showed a series of horizontal flutings reinforced above with a number of projecting studs; they appeared to belong to tall, slender vessels (at least four examples) similar to *O.R.L.* 'Wiesbaden,' Pl. XIV, No. 33. A few fragments belonged to cups or bowls ("incense bowls") ornamented with frilled cordons: No. 23 (fumed, grey-black ware), No. 24 (red, buff slip) and No. 25 (yellowish-red, darker slip). The miscellaneous ware also included about a dozen unguent-pots (two or three of them from the Fort Bathhouse), all of reddish ware, some coated with buff slip (see Pl. XXXVIII, Nos. 7 and 9), and one other small pot (yellowish-red ware) of a similar character (No. 26); two strainers—both from ditches—one grey-black, the other in red ware coated with buff slip (Pl. XXXVIII, No. 3); a small shallow tray of yellow ware (No. 27), of finer fabric than the plates already described; and, finally, at least two fragments of "face-urns"—Nos. 28-9. These are of a yellowish-red ware coated with a darker (red) slip. Each preserves part of a human face rudely modelled in relief, above which the vessel narrows to a contracted mouth, this upper surface being scored with a criss-cross pattern, possibly to represent hair or headgear. A few other fragments of similar ware showed the same scored pattern, and may have belonged to these or like vases.

MISCELLANEOUS SMALL OBJECTS

Earthenware. The earthenware objects included a lamp found in the north-west corner of the Fort; see Pl. LI, No. 1, Pl. LII, No. 1. The nozzle for the wick is damaged, but otherwise the lamp is complete. It is of a blue-grey clay coated with a yellowish-red slip. The top of the oil-container (diameter $1\frac{4}{5}$in.) shows the usual small projection on either side—rudimentary survivals of perforated suspension-lugs. The sunk disk in which the feed-hole is pierced is plain except for a raised boss in the centre. The narrow groove behind the nozzle for the wick gives no communication with the interior, and is closed at both ends.

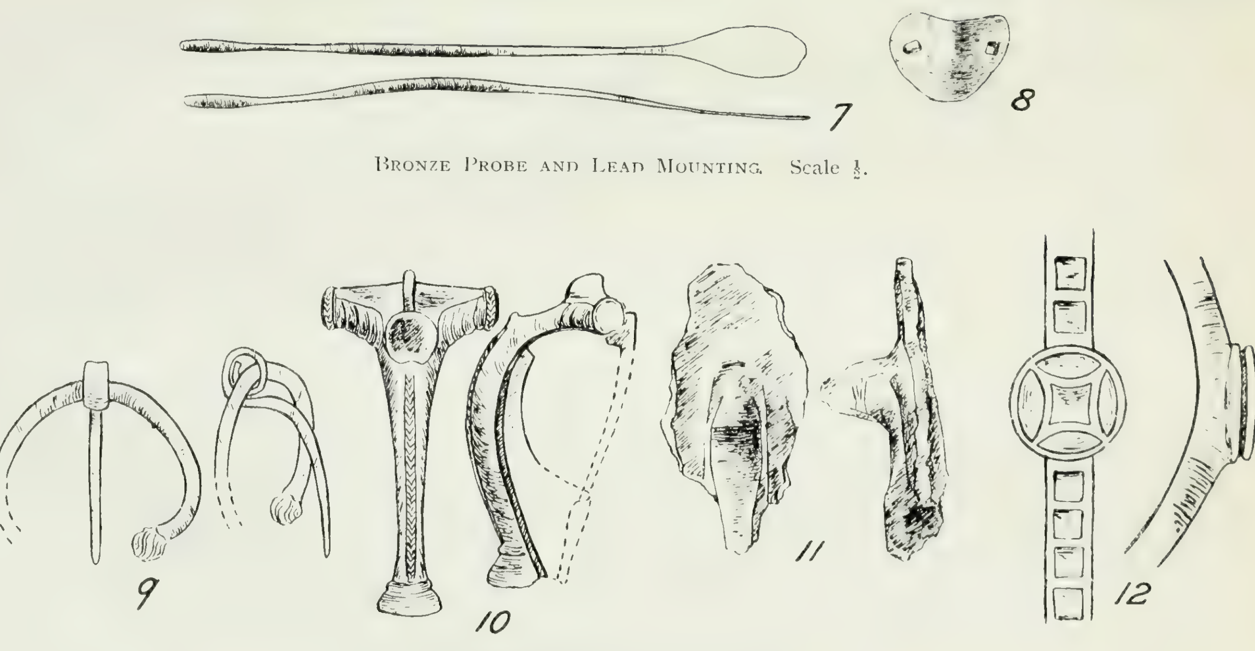


Miscellaneous Small Objects.



Objects of Earthenware and Glass. Scale $\frac{1}{2}$.

PLATE LIII.



Bronze Probe and Lead Mounting. Scale ½.

Bronze Fibulae, etc. Scale 1/1.

From Building IV of the central range came a fragment of grey ware, showing part of a shallow tray attached to a strong loop-like handle such as lampholders were provided with ; see Pl. LII, No. 2. Several earthenware objects had to do with games—one or two small disks or counters (diameter 2 in.) from the Annexe and half a dozen marbles from the Praetentura (Pl. LI, No. 2). With these objects of earthenware may be grouped two bracelets, or armlets, of shale, found in the east ditch adjoining the Annexe. One was $\frac{3}{10}$ in. thick with an interior diameter of $2\frac{3}{5}$ in., the other was $\frac{1}{2}$ in. thick with an interior diameter of $3\frac{3}{10}$ in.

Glass. Window glass was comparatively abundant in the Headquarters Building, and a few pieces were found in the Commandant's House. A good deal came from the Fort Bathhouse, but none was discovered in the Annexe Bathhouse. Over the whole barracks area only three pieces were picked up, and their presence there may have been accidental. The thickness varied from about $\frac{1}{10}$ in. to nearly $\frac{1}{4}$ in. ; in most of the fragments it was about $\frac{1}{8}$ in. A number of pieces showed the rounded edge of the moulded sheet.

Bottle glass was not uncommon. It was well distributed, but much the most productive sites were the Fort Bathhouse and the Annexe, with the ditches running between them. The Annexe Bathhouse yielded not a single fragment. The glass varied greatly in thickness, some pieces being of a very thin fabric. Though most of the pieces were of the usual pale greenish or bluish-green tinge, some were almost colourless. Coloured glass was represented by a few pieces ranging in tone from amber to brown and by one fragment of a purplish shade. All this bottle glass, like the window glass, was in fresh condition and showed no iridescence, but it was exceedingly fragmentary.

Two pieces of bottom had belonged to cylindrical bottles, while one piece indicated a hexagonal form. Eight fragments of bottom had belonged to the common square-bodied bottle. Some thirty pieces of neck or body had belonged to one or other of those types of bottle, and eight fragments showed a portion of the usual reeded handle. Pieces of narrow-necked bottles like Pl. LII, No. 3 (olive-green) and No. 4 (bluish-green) were not at all common. No. 4, the finer of the two, shows a fracture that suggests

there had been a handle attached near the top of the neck. It came from the Fort Bathhouse. So also did Pl. LII, No. 5 (bluish-green); the top, though damaged, shows part of a finished (rounded) edge, and the vessel had presumably been a phial, as indicated in the illustration. Pl. LII, No. 6 (bluish-green) came from the east ditch between the Fort Bathhouse and the Annexe. It is part of a small beaker-like vessel; the rim is folded over inside so as to form a hollow tube. One fragment (bluish-green) had belonged to a small square-bodied vessel with raised bottom (2 in. square) and indented sides. Another vessel (or vessels) with raised bottom or indented sides (or both) was indicated by some thirty small fragments found together in the north-west corner of the Fort. These were of a very thin, almost clear, fabric.

Bronze (Pl. LIII). Very few objects of bronze were discovered. No. 12 (see also Pl. LI, No. 4), had found its way into one of the front row of post-holes (*A-A*) of Block IX. It may be part of a terret. The sunk compartments in the stem and stud are filled with red enamel. In the bow fibula, No. 10 (see also Pl. LI, No. 6), the pin is hinged, so that the crest, or ridge, at the head of the bow, representing the spur or loop employed in the spring type of fibula to hold the chord in position, serves here no structural purpose. The catch-plate has no doubt been solid, as shown in the illustration. The top of the bow and the ends of the cross-piece are finished off with a narrow plaiting of corded wire. A circular cavity in the head has held a setting of red enamel, a minute fragment of which still adhered when the brooch was picked up. It was found in the Fort Bathhouse. The penannular fibula with ribbed knob terminals, No. 9 (see also Pl. LI, No. 5), came from the north-west corner of the Fort. Identical specimens have been found on Traprain Law at the second-century level.[1] No. 11 is a much decayed fragment of a small, rather thick, bronze plate with part of a projecting cheek. No. 7 (see also Pl. LI, No. 8) is an almost undamaged specimen of a surgeon's probe.

Lead. The only objects of lead that were found were a stud (Pl. LI, No. 3), a few disks varying in diameter from the size of a shilling to 2 in.,

[1] *Proc. Soc. Ant. Scot.* xlix. (1914-15), p. 165, Fig. 22, No. 1; *ibid.* l. (1915-16), p. 100, Fig. 23, No. 2.



OBJECTS OF IRON. Scale about ¼.

and a shield-shaped mounting with two symmetrically placed rivet-holes (Pl. LI, No. 7; Pl. LIII, No. 8).

Iron (Pl. LIV). Objects of iron were abundant within the Annexe and in the adjoining east ditch, and also in the Retentura and Praetentura of the Fort, notably at the north-west corner. A good many were found in the central buildings and in the Fort Bathhouse, but not one in the Annexe Bathhouse. Most were oxidised out of recognition. For a group of the least shapeless see Pl. LIV.

Most of the objects had served a constructional purpose. Nails were frequent; they were of all sizes from 1 in. to 6 in. (Nos. 1-12). There were one or two rings like No. 20, and a perforated iron washer (No. 21). Bolts, hooks and holdfasts (Nos. 13-19) were fairly common, one or two of the latter, from the Fort Bathhouse, being of the T-shaped sort (No. 18) employed to secure flue-tiles to the walls. There were a number of straps—hinge-plates or the like—*e.g.* No. 30 ($6\frac{3}{4}$ in. long), which terminates in a hook.

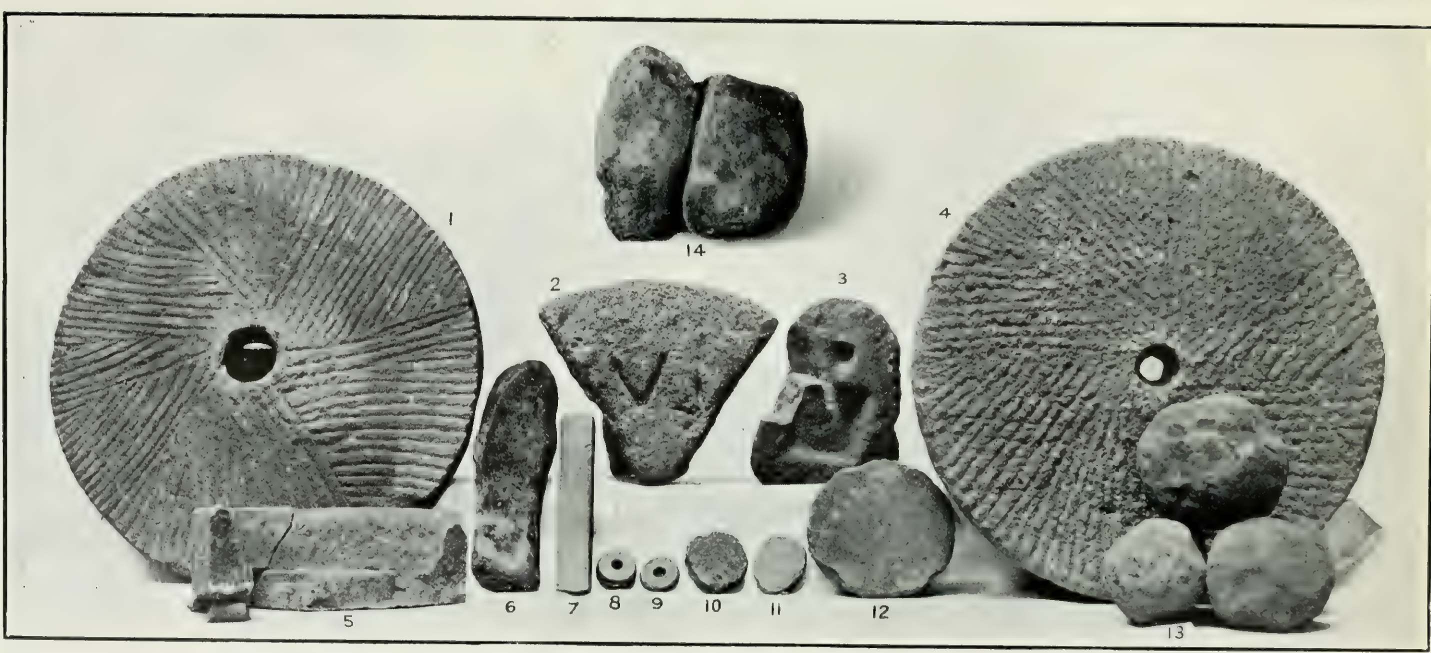
A 10 in. length of chain ending in a hook (No. 27) was found within the Commandant's House; it may have served as a pot-hanger. No. 31 (about 8 in. long) came from the Fort Bathhouse, and may, perhaps, have been a strigil; it shows a flat stem (much oxidised) $3\frac{1}{2}$ in. long and a narrow ($\frac{3}{5}$ in.) curved blade with its axis at right angles to that of the handle, as would suit a strigil. Various tools are represented among the objects illustrated. No. 25 shows a flat tang, but otherwise is oxidised out of recognition. Another tool of doubtful character is No. 22, a tanged implement with a heavy spatulate head, $3\frac{1}{10}$ in. broad. No. 23 ($6\frac{1}{2}$ in. long) shows a solid stem, square in section (1 in. square), with a thin, flat blade $2\frac{1}{4}$ in. broad. No. 26 is a punch. Another, and much heavier, punch is No. 33, which is 6 in. long and $1\frac{3}{10}$ in. square at the head. No. 24 ($6\frac{3}{4}$ in. long) is wedge-shaped, with a solid head $1\frac{3}{4}$ in. square. No. 29 (8 in. long) shows a blade, $4\frac{1}{2}$ in. long and $1\frac{1}{7}$ in. broad, at right angles to a flat stem $\frac{7}{10}$ in. broad but widening where it breaks off; it is probably a limb of a pair of shears of a common type. Iron objects recognisable as parts of weapons were very rare. No. 28 may be a spear-head; it shows a point $3\frac{1}{10}$ in. long with a well-defined check where it passes into a shank (much

oxidised) socketed for a wooden shaft. Another type of spear-head may be represented by the fragment No. 32, which is 5¼ in. long and 2 in. across its greatest breadth.

Stone (Pl. LV). A number of fragments of querns were found. Two complete nether stones are shown on Pl. LV—Nos. 1 and 4 (diameter 16-16½ in.). They are of a local sandstone grit. So also were most of the other pieces, but there were a few fragments in volcanic tuff to represent the imported article. A triangular piece of such stone (No. 2) appeared to have been used as a weight, and had the mark V-> cut on its face, perhaps to indicate five *librae*.[1] Another stone, 8½ in. by 6½ in., was grooved round the waist, as if for a line to be attached (No. 14). A broken stone mould (No. 3) and part of a shallow mortar (No. 5) were discovered in the Praetentura. Ballista balls (No. 13) lay behind the North Rampart. A number of stone disks were found of various sizes (Nos. 10-12); most of them had probably been weights, though some of the smallest may have been counters for a game, while one or two of the larger ones might have been used as quoits. Two spindle-whorls of stone were found (Nos. 8 and 9), one in a ditch at the south-east corner of the Fort, the other in the Commandant's House. One stone (No. 6) had been used as a polisher or sharpener, and whetstones of various sizes (*e.g.* No. 7) lay here and there about the Fort and Annexe.

Leather (Pls. LVI-LVII). A good deal of leather came from the west ditches at the West Gateway. Much of it had no doubt formed part of the leather clothing of the soldier; see Pl. LVI. Some of the larger pieces with stitched hems (Nos. 1-7) must have been parts of tunics, aprons or the like. One piece with scalloped edge (No. 15) may have been the fringe of a jerkin. A few of the fragments with stitch-holes along their edge suggested pockets, and a " button-stitched " slit with one margin decidedly sagging may have been the opening of a small pocket (No. 8). In one piece there was a stitched button-hole or lace-hole (No. 4). Near the edge one or two showed stitch-holes in circular patterns (diameter 2 in.), indi-

[1] About 3⅝ lb. The actual weight of the stone is a trifle over 3½ lb. With the mark following the V compare the device, scored on a stone ball at Corbridge, illustrated *Arch. Ael.* 3rd ser. vi. p. 269.



STONE OBJECTS. SCALE ABOUT $\frac{1}{7}$.

cating patches that had reinforced fastenings. One or two triangular pieces, 7 in. each way, had stitch-holes along their base, one of them (No. 16) also showing stitch-holes and two small slits at the apex; they may have been lappets of cloaks. Among the other pieces were belts (No. 9), straps or bands (No. 10; a neckband ?), circular patches with stitch-holes round the margin (No. 11), a loop for a thong or button (No. 14) and two leather mountings (Nos. 12-13).

More definite material was given by the footwear; see Pl. LVII. Besides one fragment of a wooden sole, there were many pieces of heavy, hobnailed leather soles (see Nos. 9-17). Most of the soles were of men's size, a few were of youths' or women's size, one only of child's size (No. 15). The soles, which were cut to the shape of the foot (left or right as the case might be), had consisted of a number of layers; sometimes two or three thicknesses were found still cohering, and as all these showed nail-holes, there must have been additional layers inside. Occasionally, a proper projection of the nail-heads had been secured by the use of iron washers; the nails had disappeared, but the washers remained embedded in the outer sole, like the eyelets of a modern lacing shoe, except that the "eyes" were square, since the nails had been square in section (see Nos. 10-11). In a few cases two thicknesses (proved by the smallness of the nail-holes to have been inner layers at the points of the nails) were found to have been laced or threaded together down the middle with narrow thongs (see No. 12), while one pair (inmost layers; no nail-holes) had been stitched together, also down the middle. There were other inner or inmost layers, however, which showed no such lacing or stitching, *e.g.* No. 13, which is not cut to a pointed toe.

To judge by the rarity of leather uppers compared with soles, the common footwear had been little more than a sole strapped to the foot. In some cases at least, however, a stout heelpiece, from $1\frac{1}{2}$ in. to 2 in. high, had been added, as *Bar Hill*, Fig. 36, No. 10. In some cases also a low guard, about $\frac{3}{5}$ in. high, had been fixed, in several pieces, along the edge of the sole. The lower edge of guard as well as heelpiece had been inserted between the layers of the sole and nailed along with them. For heelpiece and guard see No. 17.

At the Saalburg such guards and heelpieces (Jacobi, Pl. LXXX, Nos. 8 and 10) showed stitch-holes along their top edge, as if light uppers (of linen or the like) had been attached; and Jacobi assumes that plain soles without guards had been similarly supplemented with uppers of perishable material. At Balmuildy one sole showed stitch-holes along its edge (No. 16; inner layer, woman's size); it had been finer stitching (linen?) than that employed to fasten two layers of sole together (leather stitching). This might mean that a light upper, not of leather, had been attached. Such an upper was also suggested by similar stitch-holes along the top of one of the fragments of low guard. Though such stitching did not appear in any other fragment of guard or sole, the general use of some sort of cover for the upper part of the foot is in itself probable. Such a cover might be provided not by the shoemaker but by the wearer himself, and so would vary with the individual and the season; it might be stitched on, or simply tucked in and kept in place by the cross-straps, or it might be bound round the foot. Such a covering would, of course, be no integral part of the shoe, which would still consist essentially of a sole, with or without heelpiece and guard, strapped to the foot.

In *caligae* found at Mainz, and elsewhere, an assemblage of loops, which enabled the shoe to be laced across the foot and round the ankle, was cut in a single piece with one of the thicknesses of sole. Our nearest approach to this type was the sole referred to above (No. 16) as showing stitch-holes that suggested there had been a light upper of perishable material. In this sole a slit had been made along the outer edge so as to disengage a narrow thong with one free end. The free end and the middle of the thong had then been stitched to the sole so as to provide a double loop for laces. But this sole—a comparatively light one of woman's size—was the only one that showed such a device. One must suppose that, where there was no leather upper, the cross-straps had been inserted between the layers of sole, as in the Saalburg and Bar Hill sandals. It must be added, however, that pieces of leather which might have served as cross-straps (*e.g.* No. 6) were so very rare as to suggest that the footwear of our garrison, if it did not actually leave the shoemaker's hands as a mere sole (with or without heelpiece and guard), was soon reduced to that through wear and



LEATHER. SCALE ABOUT $\frac{1}{9}$.



LEATHER FOOTWEAR. Scale about $\frac{1}{6}$.

tear, and that various makeshift devices, and any material that came to hand, were employed by the wearer to attach the sole to the foot as well as to provide an upper covering. The same contrivance might often have served both purposes.

Heelpiece and guard supply the elements of an upper, but developed uppers of leather were rare. They had not been common soldiers' wear. Only ten pieces were found, and several of these were clearly of less than men's size. A few uppers had been made in two halves, stitched together at heel and toe (No. 5), and fastened to the sole by their lower edges being inserted between the layers and nailed with them, in the same manner as the pieces of guard described above. Unlike the simple guard, however, these more developed uppers showed, along their top edge, holes for straps or laces. Besides holes for straps across the instep and foot, one half-upper (No. 2) showed a toe-strap, cut in one piece with itself, intended to be secured to the instep-strap ; and no doubt all such shoes had been so provided. Of five shoes of this kind, two showed stitch-holes along the upper edges of the heels, perhaps indicating an inner lining to the heel, or possibly the attachment of a *fascia cruralis*. One upper (No. 7 ; small shoe) had been attached to the sole in the same way as the examples just described, but, unlike them, it showed no junction at the heel, and in place of instep-straps it had a pair of latchets. Another piece of upper with latchets (No. 1) had also been made in a single piece round the heel, but was of greater depth, and had belonged to a lighter and more close-fitting shoe ; the top of the heel was cut to a tab. All these seven shoes are of a type akin to the *calceus*.

One upper may have belonged to a different type of shoe (No. 8). Here there was no junction at the toe ; the upper had been made in a single piece joined at the heel, where there was a line of vertical stitching up the back as well as stitching along the top. Unfortunately, this piece had been torn away along the turn from upper to sole. The top part also was torn off, leaving a jagged edge which rather suggested that here there had been loops. This shoe may have been of the light type, commonly identified with the *carbatina*, in which a looped upper and a plain sole without nails were made in a single piece (Jacobi, Pl. LXXX, No. 9 ; *Bar*

Hill, Fig. 36, No. 4). A small fragment of upper with loops cut out for laces (No. 3) may also have belonged to this type. Another light upper with vertical stitching at the heel as well as stitching along the top of the heel had belonged to a fairly close-fitting shoe, with a cross-strap (cut in one piece with the rest of the upper) which appeared to have passed behind the heel.

Post-Roman Objects. A penny and two halfpennies of George III. recalled the cottages which "embarrassed" the site in the eighteenth century.[1] The ruins had apparently attracted inhabitants from an early date. Medieval green-glaze ware was found over the southern, and especially the south-eastern, part of the Fort.

CONCLUSIONS

In the Antonine period the forts at Balmuildy and New Kilpatrick had helped to control the important area of communication lying south of the Blane Valley gap between the Kilpatrick and Campsie Hills. Both sites were such as might have been occupied previously by Agricola; the one commanded a point where communication southwards from the Blane Valley forded the Kelvin, the other a point where it passed through a ravine which to this day fixes the line of high road and railway. The importance of commanding the ravine at New Kilpatrick was remarked on by General Roy. "This was one of those points of the line," he says, "to which the attention of the natives was very likely to have been directed, when watching for an opportunity of forcing their way into the Roman province: hence it was, we may suppose, that this position had been chosen for the establishment of a considerable garrison."[2] And it is to be noticed that, while the distance between Balmuildy and Castle Hill (about four miles) is the normal interval that separates a fort in the Antonine series from the next but one, the intervening station of New Kilpatrick is not nearly midway between them; it is two and a half miles from Bal-

[1] Gordon, *Itin. Sept.* p. 53.

[2] *Milit. Antiq.* p. 159.

muildy and not much more than half that distance from Castle Hill. This irregularity was presumably due to a desire to command the passage at New Kilpatrick, and the recognition of the importance of this point may well have been an inheritance from the Flavian general.

But while one may still conjecture that New Kilpatrick may have been the site of one of Agricola's *praesidia*, it is now as certain as negative evidence can make it that Balmuildy was not. A great part of the site was uncovered, and the rest closely trenched. No single object was found that indicated a Flavian occupation. The series of coins " does not contain a single specimen that might not have been dropped about the middle of the second century or later " (Appendix A). The number of coins found was small, but their evidence was abundantly confirmed by the collection of pottery ; this included many hundreds of datable fragments, and there was not one that could not be assigned to the Antonine period. Nor was any trace found of structural remains belonging to a pre-Antonine station. That the existing remains belonged to a fort laid out as part of the Antonine system was obvious from the way the turf Rampart and its accompanying Ditch were linked up with the Fort defences ; and we have seen that the name partially preserved on the fragmentary inscription from the North Gateway was the name of Pius' general, Lollius Urbicus, under whose command the Wall was built. Like other stones from the Limes, our figures of Victory and of Mars the Avenger, with the altar found alongside of them, had probably commemorated the successful conclusion of field operations preparatory to the building of the Wall. In the new system now established, Balmuildy, to judge by its site, its size and its structural character, had played a not unimportant part. We have suggested that it may have been one of the terminals of the road-system connecting the Limes with the south (p. 3).

With the accepted view that the military occupation of this frontier came to an end early in the reign of Commodus, the evidence of Balmuildy is entirely consistent. The coins do not take us beyond the reign of Pius. Most of the pottery can be assigned to the same reign ; none of it can be dated later than the reign of Marcus.

If the inclusion of a bathhouse within the defences of the Fort was due

to an early feeling of insecurity, that feeling had quite passed off by the time the east ditches near the south-east corner were filled up, and a bathhouse built over them, larger and more elaborate than that within the Fort. The alignment of the new bathhouse may have been determined by existing structures laid out at right angles to the Military Way ; indeed the particular site selected for it would seem to imply that the area to the east of the Fort, now enclosed by a ditch, was already crowded with dwellings. In any case, it cannot have been long before a more or less permanent population was settled alongside the Fort.

But the promise of those early years was not fulfilled. The Annexe Bathhouse, it would appear, had to be dismantled to floor-level, lest it should give cover to an attack—a significant index of changed conditions. Nor were the garrison's anticipations unrealised. Twice the fort suffered disaster. Here the evidence of Balmuildy confirmed conclusions already drawn by Dr. George Macdonald from the structural remains of Rough Castle and Castlecary.[1] The small Fort Bathhouse was wrecked. Presently it was repaired after a fashion, but at a later period it was again wrecked, and this time it was done away with altogether. In one or other of those disasters, or in both, other buildings suffered, notably the Headquarters Building and the Commandant's House.

The first of these disasters must be ascribed to the widespread revolt, or revolts, known from a variety of evidences to have broken out in the closing years of Pius' reign and at the beginning of the reign of Marcus.[2] This disaster is to be dated to 155 or one of the following years. The date to be assigned to the second disaster is less certain. The perfunctory character of some of the reconstructive work must be regarded as significant. No doubt secondary work in Roman forts, carried out by such auxiliaries as happened to be in garrison at the moment, is usually of an inferior character, but at Rough Castle the latest work would appear to have been inferior not only to the original masonry but also to earlier restorations on the same site.[3] At Balmuildy some of the reconstructive work gave the

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[1] Macdonald, pp. 396-7.

[2] The evidences are discussed, Macdonald, pp. 9 ff. [3] *Ibid.* p. 396.

impression of being a mere temporary makeshift, like the work of men who already anticipated an early evacuation; and some such feeling must surely have been at work to discourage the rebuilding of the Fort Bathhouse a second time, for this now meant, it would appear, doing without a bathhouse at all—a privation not likely to have been acquiesced in by a Roman garrison which saw many years of service here ahead of it. All this points to the second disaster having taken place late in the occupation. How late cannot be decided. Two dates suggest themselves. This disaster, with the restoration that followed it, may have been a mere episode of the final abandonment. On the other hand, it might have happened some ten years earlier. It is probable that the Roman hold on the frontier was more or less precarious throughout the reign of Marcus. Few coins reached the Wall that were minted later than the reign of Pius. In the mass the pottery belongs to that reign. It would suit our evidence as a whole to suppose that the military occupation of Southern Scotland never quite recovered from the disastrous years round about 160, and that the period of really effective occupation and of active interchange was confined to the reign of Pius. It has been suggested, on the evidence of the finds at Camelon and Ardoch, that the garrisons beyond the Wall may have been withdrawn before the Wall itself was given up. If that were so, it would be significant of the official attitude to this frontier in the later years of its occupation. In any case, it is not improbable that the prospect of evacuation may have overshadowed the Limes for some considerable time, and the makeshift restoration that followed the second disaster, and therefore the disaster which occasioned it, might well date back a decade or more before the final scene—to troubles midway in the reign of Marcus obscurely known to us from Capitolinus and Dio.[1]

The site, then, was first occupied about 142 as a station on the Antonine Wall built under the command of Lollius Urbicus. It was occupied for

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[1] *Vit. M. Ant. Phil.* 22: *Imminebat et Parthicum bellum et Brittanicum.* This was at the time of the death of Lucius Verus—169 A.D. Capitolinus' statement that a war was then threatening in Britain is so far confirmed by Dio, lxxi. 16, where we are told that Marcus sent to Britain auxiliaries placed at his disposal after the pacification of the Iazyges on the Danube (173 A.D.).

some forty years. In the course of that occupation the fort suffered two disasters, the first about 155 or soon after, the second late in the occupation —perhaps about 170, possibly even as late as the troubles that broke out at the beginning of the reign of Commodus and led to the final abandonment of the frontier. The view that these two disasters, which were reflected in the structural remains of Castlecary and Rough Castle as well as of Balmuildy, may have been accompanied at least once by a temporary evacuation of the Limes, is strengthened by evidences of a change of garrison at Bar Hill, Castlecary, and Mumrills.[1] At Balmuildy, unfortunately, no inscription was found recording the name of any unit that had served here as garrison. Nor can any conclusion as to the composition of the garrison be drawn from the only two names which our *graffiti* have preserved to us (both on potsherds)—Primus and Sigilius.[2] The evidences we have to go by are the rank of Caecilius Nepos as given by the Fortuna altar, the size of the Fort and (what is not quite the same thing) the barracks accommodation.

The rank of Caecilius (*tribunus*) would naturally be taken to mean that the garrison had been a *cohors miliaria*. On the other hand, the system of barracks actually retraced by our trenches would appear to have been designed, as we have seen, for a *cohors quingenaria*, probably *equitata*.[3] The

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[1] Macdonald, p. 354.

[2] See above, p. 76. Old Carlisle, where Sigilius the *emeritus* (or Sigilius Emeritus) appears, was garrisoned by an *ala*. The inscription, like our potsherd, was found outside the fort. It is a slab dedicated as "Hercules' portion." To consecrate a tithe of booty, or of any other gain, to Hercules was an ancient Latin custom. This Sigilius would appear to have been a different sort of person from the Sigillius of the Diploma, who was a Syrian serving in a Syrian cohort—the coh. I Hemesenorum. From these facts no probable inference can be drawn as to our Sigilius, still less as to the garrison of our fort.

[3] It would be against analogy to treat as centurial barracks the limbs into which our larger blocks (to judge by Block IX) were divided, and to suppose that the Praetentura had contained eight *centuriae*, and that these with Blocks XIII and XIV had accommodated the ten centuries of a *cohors miliaria*, leaving Blocks XI and XII to be explained (say) as stables, or as stables and quarters for *equites*,

evidence of the Fortuna altar might be reconciled with that of the barracks accommodation by supposing Caecilius Nepos to have been in command here of a *cohors quingenaria equitata* and to have been given the higher rank by special favour of the Emperor—*militans tribunus in praefecto dono principis.*[1] But there is an alternative supposition that would allow us to give to the rank of Caecilius its natural interpretation. We have seen that the Fortuna altar was erected before the Fort Bathhouse was done away with (see pp. 43, 47, 59-60). Caecilius, then, was in command of the garrison before the last phase of the history of the Fort was entered upon. The scheme of barracks shown on our plan, on the other hand, represents the arrangement at the time the fort was abandoned. Had the barracks been altered in the course of the occupation, and had the garrison been a *cohors miliaria* at the time the Fortuna altar was erected? We have explained that our exploratory trenches came upon patches of stones and gravel in unexpected places which gave the impression that the streets, and therefore the barracks

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on the assumption that the supposed *cohors miliaria* was *equitata*. It is not, indeed, an insuperable objection to this view that the restricted accommodation it would allow to each century would imply that the supposed *cohors miliaria* was at little more than half strength. That such a cohort would, on our Limes, be far below nominal strength is possible enough (see below, p. 109). Still, there appears to be no real parallel for centurial barracks of about half the ordinary size. And this view would give us an abnormal disposition of the barracks (see above, p. 37). To get the usual arrangement of facing *hemistrigia*, we must suppose the *hemistrigia* to have been formed by our larger blocks as a whole and not by the limbs into which they were divided. Together the blocks would then accommodate, as has been said, a *cohors quingenaria*, probably *equitata*. They could hardly be taken to have accommodated a *cohors equitata miliaria* at half strength unless we supposed this force to have been actually organised as a *cohors equitata quingenaria*. Perhaps that is a possibility not altogether to be excluded.

[1] *C.I.L.* vii. 759; cf. v. Domaszewski, *Rangordnung*, p. 130. This relates to a M. Caecilius Donatianus in command of a *cohors quingenaria* at Carvoran. Inscriptions of the coh. I. Hispanorum and the coh. I Lingonum—both *cohortes quingenariae equitatae*—mention *tribuni* as well as *praefecti* (*C.I.L.* vii. 374, 432).

It may be as well to notice here that a . . . ius Nepos appears on a fragmentary inscription (*C.I.L.* vii. 620[a]) as *praefectus* of the coh. I Aquitanorum at Carrawburgh. This cohort was at Brough, in Derbyshire, in 158 (*Eph. Epig.* IX. iv. 1108). It was not *equitata*.

blocks they enclosed, had been rearranged—an impression strengthened by the varying positions of the street gutters (pp. 32, 39, 40-1). This indication, while far from conclusive in itself, becomes significant when taken along with the Fortuna altar, and their combined testimony is strengthened by evidence from other forts of the Limes. We have epigraphic evidence relating to the garrisons of five of the forts. In the case of three of these, there is mention of two different regiments. Apparently the vicissitudes through which the Limes passed brought with them changes of garrison. These vicissitudes, we have seen, are clearly reflected in the structural remains of Balmuildy, and here, as elsewhere, the garrison may have been changed. The *cohors quingenaria*, probably *equitata*, indicated by the final barracks plan, may have been preceded by a *cohors miliaria*, of which Caecilius Nepos at one time was in command.

Our fort was not too small to have accommodated the larger size of cohort. Here we must not go by the analogy of the forts of the German Limes, where the areas are about double those assigned to the corresponding units in Britain. Judged by the scale of our own province, Balmuildy, with its 4½ acres (over the ramparts), more nearly approaches the average size of a fort designed for a *cohors miliaria* than of one designed for a *cohors quingenaria*, even when *equitata*. In the final plan the streets and *hemistrigia* were laid out upon a liberal scale, as British cohort-forts go.[1] Anyone who cares to make the calculation will find that, on the British scale, three *hemistrigia* of quite normal size could be placed on each side of the *via praetoria* and two on each side of the *via decumana*, and still leave sufficient margin for the streets. But it is by the sizes of the forts along our own Limes, which do not always tally with the average of the province, that Balmuildy must be judged. Of the forts between Forth and Clyde of which we have some definite knowledge, Castlecary is the one that most closely corresponds with Balmuildy. It was garrisoned by two *cohortes miliariae* in succession, one of them *equitata*. So far as we know,

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[1] The space assigned to each century in the final barracks plan at Balmuildy is rather greater than at Housesteads, and considerably greater than at Gellygaer, Birrens or Camelon.

it was for a *cohors miliaria* that it was originally laid out. Yet it was distinctly smaller than our fort, its external measurement being under 4 acres as against quite $4\frac{1}{3}$ at Balmuildy.

Castlecary is not the only fort on our Limes which accommodated a unit larger (nominally) than its area would lead one to expect. The name of a *cohors quingenaria equitata* (the coh. IV Gallorum), which occupied about $3\frac{2}{5}$ acres at Chesterholm, in Northumberland, appears on an inscription from Castle Hill, where the area would appear to have been less than half that of the Northumberland fort. The actual outline of the station at Castle Hill is, perhaps, not quite certain, but there is no doubt about Rough Castle. There the total area of the fort was hardly more than an acre and a half, about one-third of which was taken up by the massive ramparts; yet an inscription recording the erection of the Principia is in the name of a *cohors quingenaria* (the coh. VI Nerviorum) which occupied about $3\frac{1}{3}$ acres at Great Chesters on Hadrian's Wall. A glance at the plan of Birrens or of the Praetentura of the fort at Camelon is enough to show that extreme compactness was aimed at by those who laid out our Scottish forts, and in their restricted circuit, as in the elaborate defences of many of them, we may perhaps recognise a tribute to the formidable reputation of the northern tribes.[1] But that can hardly of itself explain the extremer cases. It looks as if some of the units serving in Scotland in the Antonine period were considerably below nominal strength.[2] On general grounds that is not improbable. The British garrison was none too strong for the work it had to do in the first half of the second century, and we know of no reinforcement at the beginning of the reign of Pius at all commensurate with the immense extension northwards of the frontier zone. This extension of the military area to about double its previous depth, without any

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[1] The inclusion of a bathhouse within the actual circuit of the fort, an arrangement found in three of the four excavated forts of our Limes but quite rare elsewhere, may be regarded as an exception which proves the rule (see p. 41, n. 2).

[2] It is possible that these may have been mere detachments from garrisons on Hadrian's Wall. See Haverfield, *A.W.R.* p. 156.

corresponding increase of the force distributed over it, explains the ineffectiveness of the Antonine system and its brief duration. If Pius' advisers contemplated an early evacuation of the southern portion of the military zone as a corollary to its extension northwards, they were to be rudely disabused, and one at least of the two disasters reflected in the structural remains of our fort was connected with an outbreak that spread over the whole Brigantian area.[1] That was in the closing years of Pius' reign, and the misgiving of the Roman government about the military occupation of Southern Scotland may date from the experience of those years.

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[1] As far south as Brough, in Derbyshire (*Eph. Epig.* IX. iv. 1108). It may have been about the beginning of the reign of Pius that Slack ceased to be garrisoned, but there is no evidence for an evacuation of Brigantian territory on a large scale. Clearly no such evacuation was possible in the Antonine period. At a later date, when the coasts were threatened by other enemies, there was more than one front to envisage, and the problem of defence changed ground. A resumption of the Antonine system was out of the question.

APPENDIX A

THE COINS

By George Macdonald, C.B., F.B.A., LL.D.

The number of coins found in the course of the excavations was 14 in all, 4 being of silver and 10 of brass or copper. The series was unfortunately too small to admit of any fresh conclusions being drawn from it. It does not contain a single specimen that might not have been dropped about the middle of the second century or later. Hence it merely confirms what we already knew as to a second-century occupation. The following are the details :

DENARII.

1. Indecipherable.

This was picked up on the floor of the Sacellum, and was absolutely illegible. Tests showed the metal to have been very base. Possibly, therefore, it may have been a legionary denarius of Mark Antony.

Vitellivs : 69 a.d.

2. *Obv.* [A VITELLIVS GERM] IMP AVG TR P Head r., laureate.
Rev. LIBERTAS RESTITVTA Liberty standing three-quarter face towards r., holding cap and leaning upon sceptre.
Cohen[2] i. p. 359, No. 47. Found in west wing of outer court of Headquarters Building.

Trajan : Cos. V = 104-110 a.d.

3. *Obv.* [IMP TRAIANO AVG GER DAC PM TR P] Bust r., laureate.
Rev. [COS V PP SPQR] OPT[IMO PRINC] Pax standing three-quarter face towards l., holding olive-branch in r. and leaning with l. on column.
Cohen[2] ii. p. 27, No. 83. Found in the Annexe.

HADRIAN : Cos. III = 119-128 A.D.

4. *Obv.* HADRIANVS [AVGVSTVS] Bust r., laureate.
Rev. [COS III] Diana standing r., holding arrow and bow.
Cohen[2] ii. p. 133, No. 315. The identification of the Rev. type is not quite certain. The coin was found within the north-east corner of the Fort.

BRASS OR COPPER.

DOMITIAN : 81-96 A.D.

5. *Obv.* [IMP CAES DOMI]T AVG GERM [COS . . . CENS . . . PP] Bust r., laureate.
Rev. [IOVI VICTORI] Jupiter, naked to waist, seated l. on throne without back, holding victory in r. and leaning with l. on sceptre ; in ex. [S C].
"First Brass." Cohen[2] i. pp. 497 f. Nos. 307 ff. (85-95 A.D.). Found in north-east corner of Fort.

6. *Obv.* Inscr. illegible. Bust of Domitian r., radiate.
Rev. [VIRTVTI AVGVSTI] Virtus standing r., with r. foot planted on helmet, holds spear and parazonium ; in field, S C.
"Second Brass." Cf. Cohen[2] i. p. 523, No. 648. Found on paved court at south end of Fort Bathhouse. Worn when lost.

TRAJAN : Cos. V = 104-110 A.D.

7. *Obv.* [IMP CAES NERVAE TRAIANO AV]G GER DAC [PM TR P COS V PP] Bust r., laureate.
Rev. [SPQ]R OPTIM [O PRINCIPI] Dacia, seated l. on shield, mourning ; in front of her, a trophy ; in ex., S C.
"First Brass." Cohen[2] ii. p. 72, No. 535. Found beneath stratum of masonry chippings underlying paved court at south end of Fort Bathhouse. The details of the Rev. are obscure.

HADRIAN : Cos. III = 119-128 A.D.

8. *Obv.* [HADRIANVS AVGVSTVS] Bust r., laureate.
Rev. [COS III] Virtus standing l., with r. foot on helmet, holds parazonium in r. and leans on spear with l. ; in field, S C.
"First Brass." Cohen[2] ii. p. 136, No. 356. Found in drain at north-east corner of Fort.

9. *Obv.* [HADRIANVS] AVG COS [III PP] Bust r., laureate.
Rev. FORTV NAAVG Fortuna, draped, standing l., holding patera and cornucopiae ; in field, [S C].
"Second Brass." Cohen[2] ii. p. 171, No. 773. Found, with No. 8, in drain at north-east corner of Fort.

10. *Obv.* [HADRIANVS AVGVSTVS] Bust r.
Rev. [IVSTITIA] AVG PP Justitia seated l., holding patera and leaning on sceptre; in ex., COS III; in field, S C.
"First Brass." Cohen[2] ii. p. 181, No. 895. Found in west wing of outer court of Headquarters Building.

11. *Obv.* [IMP CAESAR TRAIANVS HADRIANVS AVG PM TR P COS III] Bust r., laureate.
Rev. [MONETA AVGVSTI] Moneta, draped, standing l., holding scales and cornucopiae; in field, S C.
"First Brass." Cohen[2] ii. p. 186, No. 974. Found in north-east corner of Fort.

ANTONINUS PIUS: 138-161 A.D.

12. *Obv.* [ANTO]NINVS AVG PIVS PP [TR P XVI] Bust r., radiate.
Rev. [LIBERTAS CO]S III[I] Liberty standing r., holding cap and stretching out l. hand; in field, S C.
"Second Brass." If the Obv. really reads XVI, as seems probable from the spacing, the coin is Cohen[2] ii. p. 322, No. 534, and it was struck in 153 A.D. It may, however, be a year or two later. It was in very good condition when lost. It was found on the paved court at the south end of the Fort Bathhouse.

13. *Obv.* Inscr. illegible. Head of Pius r., radiate.
Rev. Inscr. illegible. Female figure, standing three-quarter face towards l.; details obscure, but possibly Fortuna with rudder and cornucopiae.
"Second Brass." Cf. Cohen[2] ii. p. 309, Nos. 391, etc. Found in the West Granary.

MARCUS AURELIUS: CAESAR = 140-143 A.D.

14. *Obv.* [AVRELIVS CAESAR PII F COS] Youthful bust r.
Rev. [PIE]TAS AVG Sacrificial knife, sprinkler, vase, augur's staff, and simpulum; in ex., S C.
"Second Brass." Cohen[2] iii. p. 47, No. 458. Found in north-west corner of inner court of Headquarters Building.

APPENDIX B

ANIMAL REMAINS

By Professor T. H. Bryce, M.D.

The animals represented in the various deposits are the dog, horse, ox and pig. The remains are very scanty, and there is little to say regarding them. The horse is only represented by one molar tooth, so that no data are available as to the breed of animal. All the ox bones indicate a small breed of oxen, but in the absence of a skull it is impossible to say whether it was the Celtic short-horn so commonly present on Roman and other early sites. The only complete horn core would indicate the presence of a long-horned, rather than a short-horned, ox, and it may be noted that at other Roman sites, as at Bar Hill, both types were represented.

The dog's skull is that of a fairly large breed of dog. It is long and narrow, and corresponds generally to one type found at Newstead. But there is nothing to prove conclusively that it is coeval with the objects of Roman workmanship.

The following are the details of the deposits :

1. From north-west corner of Fort. A few much broken bones comprising fragments of vertebrae, ribs, scapula and femur of a small breed of ox.

2. From north-west corner of Fort. Small fragments of ox bones. Two molar teeth of ox.

3. From the west ditches near north-west corner of Fort.

Skull of dog of large size—probably about that of a collie dog. The skull is long and narrow, the chief dimensions being as follows : maximum length from premaxilla to occipital region, 162 mm. ; from the same point in front to upper margin of foramen magnum, 150 mm., and to lower margin of same foramen, 148 mm.; bi-zygomatic width, 84 mm. ; bi-parietal width, 57 mm.

Fragments of ribs, scapula, humerus and radius of a small breed of ox.

Much broken fragments of the skull of ox.

Three horn cores, two fragmentary, one complete. This last measures from base to apex along the convexity 190 mm., and is 178 mm. in circumference at the base. Such a core does not correspond in size with that of the Celtic short-horn.

4. From inner west ditch at West Gate. Small fragments of bones not identifiable, and three immature molar teeth of ox.

5. From drain behind Block XIV. Upper molar tooth of horse.

6. From east end of middle street of Retentura. Small portions of burnt bone, probably of ox.

7. From Praetentura. Portion of the upper jaw of a young pig.

8. From Praetentura at north end of Fort Baths. Fragments of ox bones much broken. One of them is a " cannon bone " of slender proportions indicating a small breed of oxen.

9. From north-east corner of Fort. Molar teeth of ox.

10. From outer east ditch. Four small portions of burnt bone of some largish mammal, probably ox.

APPENDIX C

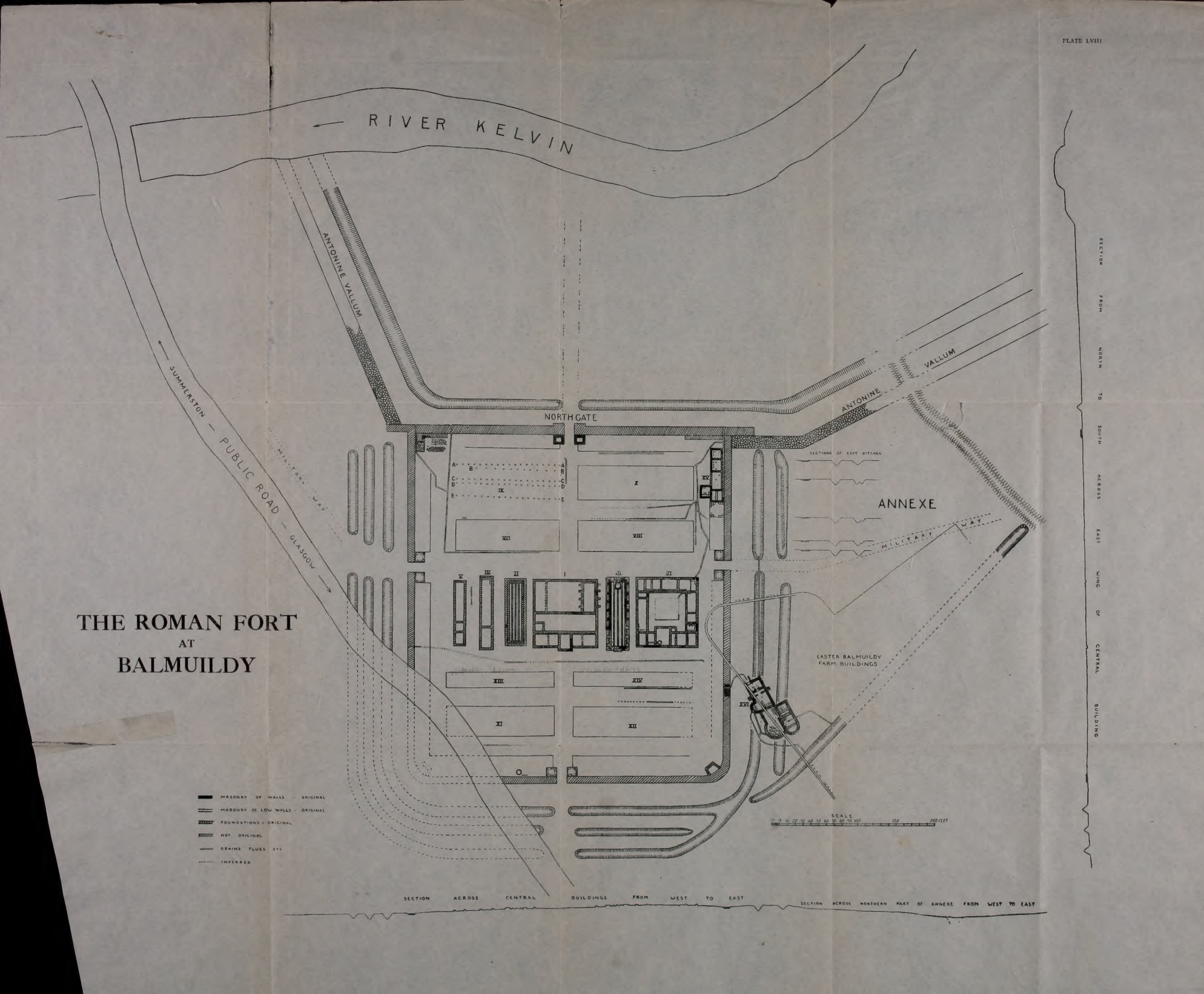
THE NAME OF THE SITE

THE name is given as " Balmuildy " in the Ordnance Survey. Stuart notes that in his day (1845) the farm was called " Balmulie or Balmuldie," though he himself prefers to employ the form " Bemulie," which was the one used in the eighteenth century by Gordon, Horsley and Roy. Maitland, however, has " Balmudy or Balmully." In Tanner's note (1699) of Urry's Inscriptions (see Macdonald, pp. 278, 313) the name appears as " Balmudy." In Timothy Pont's list (see above, p. 1) it is " Bal-muydie." Dr. George Neilson, who has been good enough to go into the matter for me, tells me that the name does not appear to be traceable beyond Pont. Its derivation seems to be beyond recovery.

INDEX

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